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CLIFFORD'S MANUAL

OF

RECITATIONS

IN

Materia Medica, Pharmacy and Therapeutics,

COMPILED FOR

The Practitioner and Student

BY

E. L. CLIFFORD, D.D.S.

Formerly Professor of Dental Materia Medica and Therapeutics, Northwestern University Dental School; Professor of General Materia Medica and Therapeutics, American College of Dental Surgery; Fellow of the Chicago Academy of Medicine, Member of the American Medical Association, the Chicago Dental Society, the Chicago Dental Club, etc., etc.

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NATIONAL ASSOCIATION OF DENTAL FACULTIES.

INDIANAPOLIS, IND., Sept. 26, 1892.

DR. E. L. CLIFFORD, CHICAGO, ILL.

Dear Sir:—The committee on Text-books of the National Association of Dental Faculties, have reported to me as follows:

"DR. J. E. CRAVENS, SEC. NAT'L ASS'N DENT. FACULTIES:

"*Dear Sir:*—I beg to inform you that the committee on Text-books of the National Association of Dental Faculties have examined the work of Dr. E. L. Clifford and the majority of its members have voted to accept it as a Text-book.

"Signed TRUMAN W. BROPHY.
Chairman."

Very truly yours,
JUNIUS E. CRAVENS,
Sec. Nat'l Ass'n Dent. Faculties.

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TO

W. W. ALLPORT, M.D., D.D.S.,

WHOSE EXPERIENCE, SKILL, HONORABLE AND USEFUL YEARS HAVE MADE HIM THE TRUE FRIEND AND SAFE GUIDE OF THE YOUNG, PROGRESSIVE DENTIST.

...THIS WORK...

IS AFFECTIONATELY DEDICATED.

AUTHORS CONSULTED.

WOOD'S THERAPEUTICS.
BARTHOLOW'S MATERIA MEDICA.
BIDDLE'S MATERIA MEDICA.
POTTER'S MATERIA MEDICA.
SHOEMAKER & AULDE'S MATERIA MEDICA.
BOWEN'S MATERIA MEDICA.
MORRIS' MATERIA MIDICA.
STEWART'S PHARMACY COMPEND.
U. S. DISPENSATORY.
GORGAS' DENTAL MEDICINE.
STOCKEN'S DENTAL MATERIA MEDICA.
MITCHELL'S DENTAL CHEMISTRY.
AM. SYSTEM OF DENTISTRY.
ANNUAL OF UNIVERSAL MEDICAL SCIENCES.
NOTES ON NEW REMEDIES.
DENTAL COSMOS.
DENTAL REVIEW.
INTERNATIONAL DENTAL JOURNAL.
THERAPEUTIC GAZETTE.
OHIO DENTAL JOURNAL.
ITEMS OF INTEREST.
PHYSICIAN'S VISITING LIST.
HUNTER'S ENCYCLOPEDIC DICTIONARY.
THOMAS' MEDICAL DICTIONARY.

PREFACE.

That a "new era" is dawning in our methods and systems of education, is evident to the progressive element in all branches of medical science. The essential requirement of the present is *crystallized knowledge.*

In the preparation of this work, I have endeavored to collect and arrange in a concise form, such *facts* as will assist and benefit the student in gaining that knowledge necessary for him to have at his command.

These facts are scattered through many volumes. Time, of course, has been spent in their collection, and no hesitancy felt in using freely the literature at hand, the language in many instances being verbatim that of the author quoted. The object being to assist the student to a better and higher education in one of the fundamental branches of medicine, if that end could be attained better through the thoughts of others, I have unhesitatingly adopted their words.

THE RECITATION SYSTEM also has proven so helpful to the members of my classes as to inspire the belief that others would appreciate the method of questions and answers.

Some attention has been given to the subject of Pharmacy, the hand-maiden of therapeutics, including as it does a knowledge of the art and science of preparing medicines.

It is not claimed that a work of this size will contain *all* knowledge upon these branches of science; it is hoped, however, that it does contain the salient and important facts as understood in this day.

To the authors whom I have consulted and used, I tender grateful acknowledgment.

E. L. CLIFFORD, D.D.S.

401 West Monroe St., Chicago, Ill.

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CLIFFORD'S MANUAL OF RECITATIONS

IN

Materia Medica, Pharmacy and Therapeutics

PART I.

GENERAL DEFINITIONS.

Q.—What general term *is used* to embrace all that appertains to the study of medicinal agents?

Pharmacology.

Q—What is Pharmacology?

It is the doctrine of drugs.

Q.—Of what does it treat?

It is the science which treats of the drugs employed in medicine; it embraces, therefore, all of Materia Medica, Pharmacy, and Therapeutics relating to drugs.

Q.—What is Pharmacy?

It is the name of the *art* which supplements the *science* of Pharmacology, viz.: the art of preparing drugs according to the requirements of the pharmacologist, and of dispensing them on the prescription of the therapeutist.

Q.—What knowledge does it embrace?

It includes a thorough knowledge of Materia Medica, an acquaintance with the theories and manipulations of Chemistry, and an intimate practical experience in many special operations peculiar to itself.

Q.—What is Materia Medica?

Materia Medica is that branch of Pharmacology which treats of the substances used in medicine, and describes their origin, composition, physical characteristics and administration, and their physiological and toxicological actions.

Q.—What are the divisions of Materia Medica?

Pharmacodynamics and Toxicology.

Q.—What does Pharmacodynamics signify?

The discussion of the physiological action of drugs; that is, the modifying power of drugs upon the normal physiological activity of the human organism.

Q.—What does Toxicology teach?

Toxicology teaches of the effects of drugs when administered in poisonous doses; also of their drug antagonists and chemical antidotes.

Q.—What is Therapeutics?

Therapeutics is the science which treats of the healing of diseases. It deals with the form, manner and time in which drugs should be administered. It instructs how to avoid incompatible combinations, and classifies remedial agents.

Q.—What are the two grand divisions of Therapeutics?

Natural Therapeutics and Applied Therapeutics.

Q.—What is the difference between Natural and Applied Therapeutics?

Natural Therapeutics includes the operation of the Vis Medicatrix Naturæ—the modes and processes of healing which occur independently of art, for the spontaneous decline and cure of disease; while Applied Therapeutics comprises the application by art of agents foreign to the living organism, for the purpose of aiding nature to restore the body to a comparatively healthy condition.

Give another division of Therapeutics as used in connection with Materia Medica.

Special Therapeutics, and General Therapeutics.

Define these divisions.

When systematically discussed under the various titles of these substances, or under the names of the diseases treated therewith, the matter is termed the *Special Therapeutics* of a certain article, or of a particular disease. When arranged so as to present certain great principles, which may be deduced from the mass of isolated therapeutical observations, it is termed *General Therapeutics.*

Give example.

"The Special Therapeutics of arsenic." "The Special Therapeutics of rheumatism." "The General Therapeutics of digestion."

Give two other divisions of Therapeutics that are referred to in professional literature.

Empirical and Rational Therapeutics.

Define these divisions.

By Empirical Therapeutics we mean the employment of a drug, or other remedial agent, in a certain case of disease, for the sole reason that some person had previously used it successfully in a case which was apparently identical with the one under treatment. Rational Therapeutics consists in the employment of an agent with a definite object, and for reasons based on known laws of the remedies and the diseases.

Q.—Why is Rational Therapeutics to be preferred?

Because it is based upon pathology and pharmacodynamics, these upon physiology, and it upon chemistry and biology.

PHARMACOPŒIAS AND DISPENSATORIES.

Q.—What are drugs?

All material agents employed in the treatment of disease.

Q.—What is a Pharmacopœia?

It is the official list of drugs, and their preparations, recognized by the medical profession in a certain country.

Q.—What is a Dispensatory?

It is a commentary upon one or more of the national pharmacopœias, treating in detail of the medicinal substances official therein, and their preparations, as well as such unofficial ones as are of especial interest.

Q.—What is meant by "Officinal" or "Official" preparations?

The terms are generally applied synonymously to such remedies as are authorized (*officialis*) by the pharmacopœia, and directed by it to be kept in the shops (*officina*).

Q.—How may Remedies be classified?

Remedies are subdivided into *mechanical*, *physical*, *dietetic*, *hygienic*, and *pharmaceutical* agents. The first four classes are usually treated of in works especially devoted to such subjects.

Q.—What are Mechanical Remedies?

Venesection; local blood-letting by means of leeches, cups, scarifications, incisions or punctures; bandages, splints, ligatures, acupressure, needle and forceps, acupuncture, aspiration, frictions, massage, etc., are mechanical remedies, and are described in works on Surgery.

Q.—What are Physical Remedies?

When light, heat or cold, electricity, galvanism, or other of the physical forces are used in the treatment of disease, they are spoken of as *physical remedies*. They are spoken of at length in works and in books devoted to them exclusively.

Q.—What is meant by Dietetic Remedies?

All relating to the food of the sick, or to special plans of diet, are included under this head.

Q.—What are Hygienic Remedies?

The clothing, bathing and cleanliness of the sick, the ventilation of the sick room, etc., belong to this subdivision, and will be found in works on practice of medicine, but more particularly in those relating to hygiene.

Q.—What are Pharmaceutical Remedies?

Substances, not essentially alimentary, which, when applied to the body, so alter or modify its vital functions as to be rendered applicable to the treatment of disease. It is preeminently with this subdivision that Materia Medica deals.

PHARMACY.

Q.—How is Pharmacy divided?

Into two departments: Official or Galenical Pharmacy, and Extemporaneous or Magistral Pharmacy.

Q.—What is Official, or Galenical Pharmacy?

It deals with the preparations of the Pharmacopœia.

Q.—What is Extemporaneous, or Magistral Pharmacy?

This includes the operations of the dispensing chemist, as directed by the physician.

Q.—What is meant by Calcination?

The application of heat to any substance for the purpose of driving off water, or volatile constituents, or the absorption of oxygen, the residue being left in a finely powdered condition without fusion.

Q.—What is Exsiccation?

A term applied to the vaporization of the water of crystallization from a crystalline body, whereas in the preparation of lime and magnesia it is carbonic acid and water which are removed by the operation.

Q.—What is Clarification?

A modified form of filtration; sometimes referred to as *colation* or *straining*.

Q.—What is Comminution?

Practically another name for bruising. It embraces various mechanical operations, such as cutting, rasping, grating, crushing, stamping, grinding, pulverizing, triturating, levigating, elutriating, granulating, etc.

Q.—What is meant by Crystallization?

The changes which take place in substances whose form is modified into definite and regular geometrical forms called crystals when they undergo solidification, either by cooling, by evaporation, by fusion, by sublimation, or by precipitation.

Q.—What is meant by Carbonization?

This refers to the method by which the volatile constituents of organic substances are destroyed without exposure to atmospheric air, the residue having the characteristic appearance of carbon.

Q.—How does it differ from Incineration?

In respect to the carbon, which in the latter is consumed because of its exposure to the air, leaving only the ash as a residue.

Q.—What is Decantation?

A simple operation consisting in pouring off gently, by inclining the vessel, any liquid containing a deposit.

Q.—What is Decoloration?

The process of removing any coloring matter which may be present in substances, such as alkaloids.

Q.—How is this process generally performed?

By combining the material with powdered animal charcoal, either as a solution or mixture, and the whole filtered.

Q.—What is meant by Deflagration?

Certain inorganic substances, when heated, yield up oxygen with resulting decomposition and sudden combustion, to which the name of deflagration has been given. Both nitrates and chlorates possess this quality, and, without due caution on the part of both physician and pharmacist, explosive compounds may be placed in the hands of patients.

Q.—What is Despumation?

Another method by which organic liquids are purified by the application of heat, as contradistinguished from clarification.

Q.—What is Dessication?

The name given to the process of drying that is frequently required in connection with pharmaceutical preparations.

Q.—What is meant by Digestion?

It is merely another name for Maceration.

Q.—What is Distillation?

The conversion of a liquid into a vapor by the application of heat, and the vapor again converted into a liquid by condensation in another vessel.

Q.—What is meant by Dry Distillation?

The distillation of a solid substance, as in the preparation and purification of zinc.

Q.—What is meant by Fractional Distillation?

The separation of liquids having different boiling points. Raising the temperature of a mixture of two liquids to a point above the boiling point of one, but below that of the other, will vaporize the one but not the other.

Q.—What is meant by Destructive Distillation?

The kind of distillation produced when the temperature is raised sufficiently high to decompose the substance, and evolve new products, possessing different qualities. Example—Coal or illuminating gas.

Q.—What is gained by Distillation?

Several objects are attained. Impurities ordinarily found in water and other fluids may be removed, as otherwise they would be unfit for certain pharmaceutical purposes; volatile products which could not be combined in the preparation of waters are thus secured and made available for various purposes.

Q.—What precautions are necessary in distilling?

The most thorough *antiseptic measures* should be adopted. The receiver should be of pure block tin, or glass. In distilling water, the first products should be thrown out to avoid collecting ammonia.

Q.—What is meant by Dialysis?

The name applied to a process, having for its object the separation of crystalloid from colloid substances, and depends for its successful application upon the principles governing *osmosis* and the diffusibility of liquids.

Q.—What are Crystalloids?

Substances possessing crystallizable properties.

Q.—What are Colloids?

Substances lacking crystallizable properties, but capable of forming with water a gelatinous mass.

Q.—What is Elutriation?

A process resembling sifting, except that it is used with water, for the removal of sand, gravel and other impurities. It includes also the method of powdering insoluble substances, mixing with water, so that the finer portion may be poured off, leaving the coarser particles at the bottom of the vessel.

Q.—What is Evaporation?

Simply another name for concentration, by which the volume of a liquid is reduced, and the volatile principles eliminated and used chiefly in the preparation of *Extracts, fluid* and *solid*, and the crystallization of salts.

Q.—What is meant by Spontaneous Evaporation?

It is that form of concentration which takes place at ordinary temperatures.

Q.—What is meant by Expression?

An operation by which we obtain liquids, as juice, or oil, from vegetable substances, or for the removal of the spirit or tincture from the *Marc* after maceration or percolation.

Q.—What is meant by Filtration?

The most perfect mechanical method of separating an insoluble substance from a liquid.

Q.—What is meant by Fusion, *Liquefaction or Melting?*

They have for their object the changing of solid substances into liquid by the application of heat without the use of a solvent, and are extensively employed by pharmacists in making ointments, plasters, etc.

Q.—What is meant by Granulation?

The reduction of a crystalline salt to a granular powder.

Q.—What is meant by Levigation?

A process similar to Elutriation, except that it is employed for the reduction of more expensive substances.

Q.—What is meant by Lixiviation?

The process of dissolving out a soluble salt from a compound, or mixed solid, by the use of water and subsequent evaporation of the solution.

Q.—What is Maceration?

Soaking a drug in a solvent until the soluble portions are dissolved.

Q.—What is Percolation?

The process whereby a powder contained in a suitable vessel is deprived of its soluble constituents by the descent of a solvent through it.

Q.—What is meant by Precipitation?

The process of separating solid particles from solutions by the action of heat, light or chemical substances.

Q,—What are the objects of Precipitation?

1st. A method of obtaining substances in the form of powder. 2d. A method of purification 3d. A method of testing chemicals. 4th. A method of separating chemical substances.

Q.—What is meant by Sublimation?

The process of distilling volatile solids. The product is called a *Sublimate.*

Q.—What is Solution?

The permanent and complete incorporation of a solid or gaseous substance with a liquid.

Q.—What is meant by a Saturated Solution?

If the solvent will dissolve no more of the substance, the product is called a *Saturated Solution.*

Q.—What solvents are used in Pharmacy?

Water, first in importance, then alcohol, glycerin, ether, benzin, chloroform, bisulphide of carbon, acids, and oils, take their respective ranks as solvents.

Q.—What is Torrefaction, or Roasting?

The application of heat for the purpose of modifying the character of organic substances, as in the roasting of coffee, the degree of heat being less than that for carbonization.

Q.—What is Trituration?

Rubbing substances to fine particles by means of a pestle and mortar.

CLASSIFICATION OF PREPARATIONS.

Q.—How may Official Preparations be classified?

According to their physical state, into liquids, solids and semi-solids.

Q.—How many Liquid Preparations are recognized by the U. S. Pharmacopœia, and how are they subdivided?

Nineteen, and divided into aqueous, alcoholic, etherial, acetous, oleaginous and glycerines.

Q.—How many solid preparations are recognized by the U. S. P.?

Fourteen.

Name them.

Extracts.
Abstracts.
Resins.
Masses.
Pills.
Troches.
Confections.
Powders.
Triturations.
Papers.
Ointments.
Cerates.
Plasters.
Suppositories.

Name the Aqueous Preparations.

Waters.
Decoctions.
Mucilages.
Solutions.
Syrups.
Mixtures.
Infusions.
Honeys.

Name the Alcoholic Preparations.

Fluid Extracts.
Spirits.
Tinctures.
Elixirs.
Wines.

Name the Etherial Preparations.

Oleoresins.
Collodions.

Name the Acetous Preparations.

Vinegars.

Name the Oleaginous Preparations.

Liniments.
Oleates.

Name the Glycerin Preparations.

Glycerites.

Q.—Of these preparations which are classed as semi-solids?

Confections, Extracts, Cerates, Liniments, Oleates, Ointments, Plasters and Suppositories.

Q.—Besides these mentioned, are there any other preparations recognized?

Yes, they are termed *Natural Preparations*, and named Alkaloids, Glucosides, and other Neutral principles; also the Acids, Alkalies, etc.

Q.—What are ABSTRACTA, Abstracts?

Alcoholic abstracts in the form of powders diluted with sugar of milk, and are double the strength of the drugs from which they are made.

Q.—What are ACETA, Vinegars?

Solutions of the active principles of certain drugs in dilute acetic acid; they each contain the soluble principles from ten per cent. of a drug.

Q.—What are ALKALOIDEA, Alkaloids?

Alkaloids are natural principles existing in plants, or animal tissue, and extracted therefrom by chemical art. They are organic bases, forming salts with acids, and regarded as compound ammonias, products of albuminous decomposition in the plant or animal cells during process of growth.

Q.—How do their official names always terminate?

Latin—ina; English—ine.

Into what two general divisions are Alkaloids divided, *chemically?*

Into Amides, composed of C, H, N and O; and Amines, composed of C, H, and N (Oxygen wanting).

Q.—What are the peculiar characteristics of the Amides and Amines?

They all contain N. The Amides are non-volatile, solid; the Amines, volatile, liquid.

Q.—What organic products are allied to the alkaloids?

Leucomaines and Ptomaines.

Q.—What are Leucomaines?

The alkaloids produced in the living animal tissues by decomposition of albuminous matter during the normal processes of waste.

Q.—What are Ptomaines?

The alkaloids produced by putrefaction.

Name some of the official alkaloids.

Atropina, Morphina, Quinina, etc.

Q.—What are AQUÆ, Waters?

Aqueous solutions of volatile substances which may be either solids, liquids or gases. They are dissolved either by solution in cold or hot water, by infiltration through an absorbent powder, by percolation through cotton saturated with the substance, or by distillation.

Q.—What are CERATA, Cerates?

Unctious preparations, similar to ointments; but of much firmer consistance, as they all contain wax (cera), and do not melt below 104° F.

Q.—What are CHARTA, Papers?

Strips of paper medicated by impregnation with medicinal substances, or by coating therewith.

Q.—What are COLLODIA, Collodions?

Liquid preparations, having for their base a solution of gun-cotton in a mixture of ether and alcohol.

Q,—What are CONFECTIONES, Confections?

Medicinal substances formed into a mass with sugar, honey, water, etc., with the object of rendering them palatable and preserving them from change.

Q.—What are DECOCTA, Decoctions?

Aqueous preparations of vegetable drugs made by boiling them in water for fifteen or thirty minutes, and adding enough water to make the finished product of ten per cent. strength, unless otherwise directed.

Q.—Are they desirable preparations?

No. Heating is injurious to the active principles of most drugs.

Q.—What are ELIXIRIA, Elixirs?

Aromatic, sweetened preparations, containing active medicinal agents in small quantity, and made with a menstruum of alcohol one part, and water three parts.

Q.—What are EMPLASTRA, Plasters?

Solid compounds of tenacious but pliable consistence, and intended for external application. They are spread evenly on chamois skin, muslin or kid skin, and intended to adhere closely to the surfaces to which they are applied.

Q—.What are Extracta, Extracts?

Solid, or semi-solid preparations obtained by evaporating solutions of vegetable principles.

Q.—What are Extracta Fluida, Fluid Extracts?

Alcoholic solutions, or concentrated tinctures of vegetable drugs, made by percolation and partial evaporation.

They are of uniform strength, 1 c.c. of which represents 1 Gm. (about 1 ♏ to the gr.) of the crude drug.

Q.—What are Glucosidea, Glucosides?

Organic compounds belonging to the group of *Natural Principles*, which exist in plants, and which are resolved into glucose and some other principle by the action of reagents, or natural ferments.

Q.—How does the official name of Glucosides always terminate?

Latin—inum, English—in. There are, however, preparations which have this termination which are not Glucosides.

Q.—What are Glycerita, Glycerites?

Mixtures of medicinal substances with glycerin.

Q.—What are Infusi, Infusions?

Aqueous preparations of vegetable drugs, using hot or cold water, but without boiling, and in the proportion of ten per cent. unless otherwise directed.

Q.—What are Linimenta, Liniments?

Thin, oleaginous preparations for external use with friction.

Q.—What are Liquores, Solutions?

They are all aqueous solutions of non-volatile substances, except the syrups, infusions and decoctions. There is one exception to the above rule (Liquor Gutta Perchæ), it being a solution in chloroform.

Q.—What are Massæ, Masses?

The active ingredients and the excipient, used in making pills.

Q.—What are Mellita, Honeys?

They differ from syrups simply in having honey for their base.

Q.—What are MISTURÆ, Mixtures?

Aqueous preparations of insoluble substances, held in suspension by a suitable vehicle.

Q.—What are MUCILAGINES, Mucilages?

Thick, viscid liquors, prepared by dissolving gum in water, or by extracting with water the mucilaginous principles of certain plants.

Q.—What are Neutral Principles?

These include the *Carbo-hydrates* (starch, sugars, gum, etc.); *Albuminous bodies*, which may act as ferments; *Bitter Principles* and *Glucosides*.

Q.—What are OLEATA, Oleates?

Liquid solutions of metallic salts and alkaloids in Oleic acid, intended for external use.

Q.—What are OLEORESINÆ, Oleoresins?

Liquid preparations consisting principally of natural oils and resins, extracted from vegetable drugs by percolation with stronger ether. They are the most concentrated liquid preparations of drugs which can be produced.

Q.—What are PILULÆ, Pills?

Spherical masses, composed of medicinal agents, and intended to be swallowed whole.

Q.—What are PULVERES, Powders?

Dry substances in a state of minute subdivision, obtained by pulverization.

Q.—What are RESINÆ, Resins?

Solid preparations obtained by precipitating the resinous principles of plants from their alcoholic solutions by the agency of water.

Q.—What are SPIRITUS, Spirits?

Alcoholic solutions of volatile substances, which may be solids, liquids or gases.

Q.—What are SUPPOSITORIA, Suppositories?

Solid bodies consisting of medicinal substances incorporated with Cacao-butter (Oleum Theobroma), and intended for introduction into the rectum, vagina or urethra.

Q.—What are SYRUPI, Syrups?

Concentrated solutions of sugar in water or in aqueous liquids, sometimes containing acetic acid and occasionally alcohol.

Q.—How are Syrups divided.

Into *simple, medicated or flavored*, according as they are simple solutions of sugar in water alone, or contain soluble medicinal substances, or flavored ingredients.

Q.—What are TINCTURÆ, Tinctures?

Alcoholic solutions of medicinal substances, all except one (tincture of Iodine) being from non-volatile bodies. They are prepared by percolation, maceration, solution or dilution. A solution in spirits of ammonia is termed an *ammoniated tincture*, and a solution in etherial spirit an *etherial tincture*.

Q.—What are TRITURATIONES, Triturations?

Finely comminuted powders, each consisting of a suitable medicinal substance, and sugar of milk as a diluent in the proportion of ten per cent.

Q.—What are TROCHISI, Troches?

They are also called Pastiles, Tablets and Lozenges, and are small flattened cakes consisting of medicinal substances, incorporated with sugar, mucilage of Tragacanth, etc.

Q.—What are UNGUENTA, Ointments?

Soft, fatty mixtures of medicinal agents, with a basis of lard, petroleum, or fixed oils, intended for application to the skin by inunction.

Q.—What are VINA, Wines?

When medicated they are practically tinctures; white wine of a definite alcoholic strength being the menstruum used.

Q.—May medicine be prescribed in other forms than those referred to above?

Yes. There is a variety of Unofficial Preparations, consisting of:

Baths.
Boluses.
Bougies.
Poultices.
Collunarium.
Collyrium.
Electuaries.
Emulsions.
Enemas.

Wafers.
Capsules.
Gargles.
Inhalations.
Pessaries.
Disks.
Dragees.
Granules.
Injections.
Paints.
Fomentations.
Draughts.
Lotions.
Drinks.

UNOFFICIAL PREPARATIONS.

Q.—What are Balnea, Baths?

They are baths containing some medicinal ingredients.

Q.—What are Boli, Boluses?

Solid preparations larger than pills, but intended to be swallowed whole.

Q.—What are Bougia, Bougies (Pencils)?

Urethral and uterine suppositories made long and slender for adaptation to those canals.

Q.—What are Cachets, Wafers?

Thin disks made of flour and water, forming a convenient vehicle for the administration of powdered drugs.

Q.—What are Capsulæ, Capsules?

Small alongated gelatine boxes with rounded ends, which dissolve readily in the stomach, setting their contents free.

Q.—What are Cataplasmata, Poultices?

Soft, moist applications of bread, meal, bran, or other mucilaginous substances to be applied externally.

Q.—What is a Collunarium?

A nasal douche or wash.

Q.—What is a Collyrium?

A similar preparation for use in the eye, an eye-wash.

Q.—What is a Discus, Disk?

A thin scale of gelatine, medicated as required, for local application to the eye.

Q.—What is a Dragee?

The French name for a sugar-coated pill.

Q.—What are Electuaria, Electuaries?

Preparations of a similar character to confections, but of the consistency of thick paste.

Q.—What are EMULSIONES, Emulsions?

Mixtures which contain an oil or a resin minutely subdivided, and in a state of "suspension" in the mixture by means of some viscid material.

Q.—What are ENEMATA, Enemas, Clysters?

Liquid preparations for injection into the rectum. They may be laxative, demulcent, nutritive, stimulant, or vermifuge in character.

Q.—What is a FOTUS, Fomentation?

A lotion used hot.

Q.—What is a GARGARYSMA, a Gargle?

A mixture or solution for application to the pharyngeal mucous membrane.

Q.—What is a GRANULE?

A very small pill, also called *parvule*, usually composed of alkaloidal or other powerful drugs.

Q.—What is a HAUSTUS, a Draught?

A mixture consisting of a single dose, usually about one or two fluid ounces in volume.

Q.—What are INHALATIONES, Inhalations?

Medicines in the form of a vapor, a gas or an atomized spray intended for inhalation for their local action on the respiratory mucous membrane.

Q.—What are INJECTIONES, Injections?

Aqueous preparations intended for introduction into the cavities of the body by means of a syringe. They are termed vaginal, urethral, vesical, nasal, aural, hypodermatic, etc., according to the locality wherein employed.

Q.—What is LOTIO, a Lotion or Wash?

An aqueous solution or mixture of medicinal substances intended for external use.

Q.—What are PESSARIA, Pessaries?

Suppositories of large size for use in the vagina. The term is also applied to certain mechanical contrivances used by gynecologists to support the uterus in position, Q.—What are PIGMENTA, Paints?

Fluid or semi-fluid preparations for external use to be applied with a brush.

Q.—What is POTUS, a Drink?

A mixture or solution intended to be used *ad libitum.*

WEIGHTS AND MEASURES.

Q.—What Weights and Measures are used in prescribing and dispensing medicine?

Troy or *Apothecaries'* weight is used in dispensing solids, while *Wine* or *Apothecaries'* measure is employed for liquids. The *Metric System* is also used in prescribing.

Q.—What is Apothecaries' Weight?

In Apothecaries' weight the pound is divided into ounces, drachms, scruples and grains as follows:

20 grains (gr.)=1 scruple (℈).
60 grains, or 3 scruples=1 drachm (ʒ).
480 grains, or 24 scruples, or 8 drachms=1 ounce (℥).
5,760 grains, or 288 scruples, or 96 drachms, or 12 ounces=1 pound (℔).

The signs gr., ʒ, ℥, should alone be used in prescription writing.

Q.—What is Wine Measure?

In Wine Measure the gallon is divided into pints, fluidounces, fluidrachms, and minims, thus:

60 minims (♏)=1 fluidrachm (fʒ).
480 minims, or 8 fluidrachms=1 fluidounce (f℥).
7,680 minims, or 128 fluidrachms, or 16 fluidounces=1 pint (O).
61,440 minims, or 1,024 fluidrachms, or 128 fluidounces, or 8 pints=1 gallon (C).

The signs ♏, fʒ, f℥, O, are alone used in prescriptions.

Describe the Metrical System of Weights.

In the Metrical, or decimal, system the gramme is multiplied or divided by ten. Greek prefixes denoting the multiplication, and Latin the subdivisions of the unit, thus:

10 milligrammes = 1 centigramme.
100 milligrammes, or 10 centigrammes = 1 decigramme.
1,000 milligrammes, or 100 centigrammes, or 10 decigrammes = 1 gramme.
10,000 milligrammes, or 1,000 centigrammes, or 100 decigrammes, or 10 grammes = 1 decagramme.
100,000 milligrammes, or 10,000 centigrammes, or 1,000 decigrammes, or 100 grammes, or 10 decagrammes = 1 hectogramme.
1,000,000 milligrammes, or 100,000 centigrammes, or 10,000 decigrammes, or 1,000 grammes, or 100 decagrammes, or 10 hectogrammes = 1 kilogramme.

In writing prescriptions in the metrical system the gramme (gm.) alone is used for both solids and fluids, the abbreviation being *preceded by Arabic figures*, or decimals denoting the amount of the drug, (*e. g.* 10.0 gm., 0.02 gm., etc.)

Q.—What is a Gramme?

The gramme is the weight of a cubic centimeter (C.c.) of distilled water at 4° C. (39.5° F.)

Q.—What is a Centimeter?

A centimeter is the $\frac{1}{100}$ of a meter (39.37 inches) approximately $\frac{4}{10}$ of an inch; it is the ten-millionth part of a quarter of a meridian of the earth (or of the distance from the pole to the equator).

Q.—What relation does the the Metric System of Weights bear to Apothecaries' weight and measure?

One gramme = 15.5 grains; 1 decigramme (0.1 gm.) = 1.5 grains; 1 centigramme (0.01) = .15 (or $\frac{1}{6}$) grain; 1 milligramme (0.001 gm.) = .015 (or $\frac{1}{64}$ grain); (gr.j) = .06 gramme; 1 drachm (ʒj) = 4.0 gramme (approximately); 1 ounce (℥j) = 32.0 grammes, approximately.

As the weight of a C.c. of fluid depends upon its density, 1.0 gm. of a light liquid (*e. g.* alcohol) will measure more than the same weight of a heavy liquid (*e. g.* glycerin). Approximately, however, ♏j. = .06 gm.; fʒj = 4.0 gm. (a little less), and f℥j = 32.0 gm. (a little less).

Q.—What approximate measures are used in medicine.

Medicines are sometimes ordered in *drops* instead of minims. A teaspoonful is often used for fʒj, or 5.0

gm; a tablespoonful for f℥ss, or 20.0 gm.; a wineglassful for f℥ij; but these are uncertain measures, and should only be employed when an excess of the quantity intended would be harmless.

Q.—In comparing the metric system with the Apothecaries' weights and measures, what rule is sufficiently accurate for writing prescriptions?

To consider 1 gramme as equal to 15 troy grains, and 1 C.c. as equal to 15 minims, or ¼ fʒ.

FINENESS OF POWDER.

Q.—How is the fineness of powder usually denoted?

Either by descriptive words, or in terms expressing the number of meshes to a linear inch in the sieve. The following degree of fineness will prove serviceable in the preparation of dentifrices, polishing powders, etc.:

A *very fine* powder=.........No. 80 powder.
A *fine* powder=..............No. 60 powder.
A *moderately fine* powder=..No. 50 powder.
A *moderately coarse* powder=No. 40 powder.
A *coarse* powder=..........No. 20 powder.

ABBREVIATIONS.

Q.—What are Abbreviations, as applied to writing prescriptions?

Letters, parts of words, or certain symbols, employed to designate the substance, quantity, etc.

Memorize the following table of abbreviations:

ABBREVIATION.	LATIN.	ENGLISH.
āā	Ana	Of each.
Ad. saturand	Ad saturandum	Until saturated
Ad. lib	Ad libitum	At pleasure.
Aq	Aqua	Water.
Aq. tepid	Aqua tepida	Warm water.
Aq. ferv	Aqua fervens	Hot water.
Aq. dest	Aqua destillata	Distilled water.
C. or Cong	Congius	A Gallon.
Chart	Chartula	A small paper.
Coch	Cochlear	A spoonful.
Coch. mag	Cochlear magnum	A tablespoonful.
Coch. parv	Cochlear parvum	A teaspoonful.

Colent	Colentur	Let it be strained.
Collyr	Collyrium	An eye water.
Comp	Compositus	Compound.
Contus	Contusus	Bruised or broken.
Cort	Cortex	Bark.
Ext	Extractum	An extract.
F., or Fl	Fiat vel fiant	Let there be made.
Fol	Folium vel folia	Leaf, or leaves.
Garg	Gargarysma	A gargle.
Gr	Granum vel grana	Grain or grains.
Gtt	Gutta vel guttæ	Drop or drops.
Haust	Haustus	A draught.
Infus	Infusum	An infusion.
M	Misce	Mix.
Mass	Massa	A Mass.
Mist	Mistura	A mixture.
O	Octarius	A pint.
Pil	Pilula vel pilulae	Pills or pill.
Pulv	Pulvis vel pulveres	Powder, or powders.
Qs	Quantum sufficit	A sufficient quantity.
℞	Recipe	Take.
Rad	Radix	Root.
S	Signa	Write or give directions
Spts	Spiritus	Spirits.
ss	Semis	The half.
Syr	Syrupus	Syrup.
Tinct	Tinctura	A tincture.
℔	Libra	A pound.
℥	Uncia	An ounce.
ʒ	Drachma	A drachm.
℈	Scrupulus	A scruple.
f℥	Fluiduncia	A fluidounce.
fʒ	Fluidrachma	A fluidrachm.
♏	Minim	A drop.

PRESCRIPTION WRITING.

Q.—What are Extemporaneous Prescriptions?

Formulæ written by a practitioner on the instant (*ex tempore*) to meet the requirements of individual cases.

Q.—Of what does a Prescription consist?

Four component parts, viz.:

The Superscription.

The Inscription.

The Subscription.

The Signature.

Q.—What is the *Superscription?*

The sign ℞, signifying "take" or "take thou," and in some cases the name and address of the patient, with the date.

Q.—What is the *Inscription?*

The body of the prescription, containing the names of the drugs which are used, with the amount of each.

Q.—What is the *Subscription?*

The directions to the apothecary regarding the preparation of the medicine usually expressed in contracted Latin.

Q.—What is the *Signature?*

Commencing with S., or Sig. (*signa*, write), it includes the directions for taking the medicine, the physician's name, and sometimes the date, which may be placed here instead of at the beginning of the prescription.

Q.—What language instead of English is used in writing prescriptions.

Latin.

Q.—What part of a prescription is usually written in English and what part in Latin?

It is customary to write the superscription and signature in English, the inscription and subscription in abbreviated Latin.

Q.—How is the Inscription sometimes divided?

Into Basis, Adjuvant, Corrective, Vehicle or Excipient.

Q.—What is the Basis?

The principal ingredient.

Q.—What is the Adjuvant?

A medicament to assist the action of the Basis.

Q.—What is the Corrective?

A medicine to correct some injurious quality of the other ingredients.

Q.—What is the Vehicle, or Excipient?

A substance to give it form.

Q.—Must a prescription necessarily contain these subdivisions?

No. It may consist of the Basis alone, or the basis with a simple vehicle or diluent. On the other hand, there is no limit to the number of ingredients which may be used, provided no incompatibility exists.

Q.—What is the first step in writing prescriptions?

The Superscription.

Q.—What next?

The title of each ingredient.

Q.—How should these be written?

In Latin, and in the genitive case, except when only a certain number of the ingredient is to be used. It should then be in the accusative case; as, for example, "*Vitellum unum*, one yolk of egg."

Q.—What next?

The quantity of each ingredient sufficient for one dose should be mentally determined, and multiplied by the number of doses which the mixture is to contain, and the result set down in signs and Roman numerals if written in apothecaries' weight and measure, or by Arabic figures and abbreviations if written in the metric system, opposite the designation of each article.

Q.—What next?

The Subscription and Signature.

Q.—When an unusually large dose is prescribed what practice is customary?

To underline the quantity; which signifies to the pharmacist that the large dose is intentional.

Give an example of a prescription.

July 4th, 1890.

For Mrs. Jones:

℞	Tinct. Ferri Chloridi,	fʒij		8 gm.
	Acidi Acetici Diluti,	fʒj	or	4
	Liquoris Ammonii Acetatis,	f℥j.		32
	Elixir Aurantii,	f℥xiij		52

M. et Signa: Take one tablespoonful in water, three times a day, after eating.

Jno. Smith, M.D.

Q.—Could the above prescription be written in any other way?

Yes. Instead of writing "Elixir Aurantii, fʒxiij," the following may be inserted: "Elixir Aurantii, q. s. ad f℥iij; q. s. meaning "*quantum sufficit*," or a sufficient quantity to make the whole mixture measure f℥iij.

Q.—Why are the titles of the drugs written in the genitive case?

The verb "recipe" (℞, "take thou") governs not the drug, but the quantity to be taken, which is placed in the accusative case; "take thou two drachms," the name of the drug *limits* the meaning of the quantity expressed, and, according to rule, is placed in the genitive case, and governed by the amount: ("take thou two drachms," of what?—of the tincture of the chloride of iron).

Q.—Given a prescription containing a number of doses of different ingredients, how can a single dose of any one drug be ascertained?

Calculate the number of doses in the mixture, and divide the quantity of any ingredient by the number, the result is a single dose.

Q.—Are there any special precautions which should be observed in writing prescriptions?

Yes. The prescriber should be careful:—

1st. To bear constantly in mind the object for which the medicine is wanted, in order that he may better combine his remedies to accomplish his purpose.

2d. The writing should be clear and distinct, and the words not so abbreviated as to be unintelligible, or susceptible of more than one meaning. Attention to these points will prevent the occurrence of mistakes in compounding the medicine.

3d, The doses should neither be large enough, nor close enough together (in case of powerful medicines) to cause injurious effects; it is better to give too little than too much.

4th. Medicines which form poisonous compounds (as calomel and sodium chloride) should not be combined in the same prescription.

5th. Remedies should not be combined (except for particular purposes) which are physiological antagonists; *i. e.*, which by their actions on the body render each other inert.

6th. Remedies should not be combined for internal administration which are chemically incompatible; *i. e.*, which will decompose or precipitate each other.

7th. The prescription should be as simple as possible, and contain as few ingredients as the nature of the case will allow.

8th. It is better not to order a larger quantity of the medicine than the patient will require.

9th. Never send out a prescription without carefully reading it, to be certain no mistake has been made.

10th. Never give a patient a prescription which has been corrected. If a mistake has been made rewrite the prescription entirely.

11th. Never prescribe powerful oxidizing agents with others which are readily oxidizable, as explosive compounds will result.

OXIDIZERS.

Nitric acid.
Chromic acid.
Free Hydrochloric acid.
Nitro-hydrochloric acid.
Potassium chlorate.
Potassium permanganate.

OXIDIZABLE OR COMBUSTIBLE.

Glycerin, sugar, alcohol.
Sulphur and Sulphides.
Oils and ethers.
Dry organic substances.
Phosphorus.

Q.—As a rule are abbreviations in a prescription popular?

No. They may mislead, their lavish use is a sign of the prescriber's ignorance of Latin, they confound the compounder, enhance the chances for error, and are therefore a frequent source of danger to the patient —for example: Ac. Hydroc. may mean Acidum Hydrochloricum, or Acidum Hydrocyanicum. Chlor. may mean Chlorum, Chloral, or Chloroform. Hyd. Chlor. may mean Hydrate of Chloral, or Hydragyri Chloridum. Aq. Font. might be read Aqua fortis.

Give a list of verbs in prescription writing.

Adde	Add.
Cola	Strain
Divide	Divide.
Extende	Spread.
Fac	Make.
Filtra	Filter.
Macera	Macerate.
Misce	Mix.
Recipe	Take.
Signa	Write.
Solve	Dissolve.
Tere	Rub.

Nearly all in the imperative mood, giving direction to the compounder, and having their object in the accusative case.

A few verbs are found in the subjunctive mood, taking their subject or predicate in the nominative case. The most usual are:

Fiat	Let be made.
Fiant	Let be made.
Coletur	Let be strained.
Coloretur	Let be colored.
Sumatur	Let be taken.
Bulliat	Let boil.
Capiat	Let take.
Detur	Let be given.
Dividatur	Let be divided.
Sit	Let it be.

Give a list of Participles.

Participles, or verbal adjectives, are occasionally used, and should agree with their respective nouns in gender, number and case.

Such are the following:

Dividendus—a—um	To be divided.
Sumendus—a—um	To be taken.
Adhibendus—a—um	To be administered.

Give list of Prepositions.

Ad	To, up to.
In	Into.
Supra	Upon.
Cum	With.
Pro	For.
Sine	Without.

The first three require the noun following to be in the accusative case, the last three require the ablative case.

Ana, of each, governs the genitive case.

Q.—Are there any other Words and Phrases (not classified) used in writing prescriptions?

Yes, the following:

Bene	Well.
Bis	Twice.
Dein	Thereupon.
Et	And.
Gradatim	Gradually.
Guttatim	By drops.
In dies	Daily.
Da	Give.
Non	Not.
Numerus	Number.
Octarius	A pint.
Semel	Once.
Simul	Together.
Statim	At once.
Ter	Thrice.
Quater	Four times.
Ad saturandum	To saturation.
Numero	To the number of.
Quantum sufficiat	As much as necessary.
Pro re nata	According to need.
In partes æquales	Into equal parts.
Redactus in pulverem	Let be pulverized.
Secundum artem	According to art.
Non repetatur	Let it not be repeated.

ADMINISTRATION OF MEDICINES.

Q.—How are medicines introduced into the circulation?

By various routes: as the gastro-intestinal tract, the rectum, the respiratory tract, the veins and arteries, the sub-cutaneous tissue, and the integument itself.

Q.—What route is most frequently employed?

The gastro-intestinal, it being the most convenient.

Q.—Through this route how is the circulation reached?

Through the walls of the gastro-intestinal blood vessels and the lacteals.

Q.—What substances pass through the walls of the vessels most rapidly?

Crystalloids in solution, and most so when the stomach is empty.

Q.—What substances pass with difficulty?

Colloids (fats, albumen, gum, gelatin, etc.), they require to be digested and emulsified before they can be absorbed.

Q.—What class of remedies are administered by the rectum?

Enemas and suppositories.

Q.—What substances are most suited to this route?

The salts of the alkaloids in solution, especially those of morphine, atropine and strychnine, the latter being absorbed more rapidly from the rectum than by the stomach; acid solutions, if not too frequently repeated, are also well administered by this channel.

Describe the administration by the respiratory tract.

The extensive blood supply of this tract admits of the rapid absorption of medicinal substances. The inhalation of vapors, or atomized fluids, the insufflation of powders into the nares, fauces, larynx, etc., and the use of the medicated nasal douche, are methods by which this channel may be utilized.

Q.—For what purposes are the Veins utilized as a route for administration?

Only for medication in emergencies where other channels are not available, and where immediate action is necssary to the preservation of life, the operation being a highly dangerous one. Among the instances admitted in practice may be enumerated Opium-narcosis, Chloroform Asphyxia, Poisoning by Hydrocyanic Acid, Bites of Venomous Reptiles, Collapse, etc.

Q.—What is a prominent point of danger by this method?

The admission of air into the circulation, an occurrence which causes instant death in the human subject.

Q.—By what general term is the method of administration by the subcutaneous cellular tissue known?

The Hypodermic, more correctly the Hypodermatic.

Describe this method.

By this method the remedy is introduced through the skin into the subcutaneous tissue, from which it is quickly absorbed by the lymphatic and capillary vessels. It is injected by means of a small syringe armed with a long, hollow needle.

Q.—Are there any special precautions for medication by this method?

Yes. The medicines must be in solution, of neutral reaction, and freshly prepared, the usual menstruum being distilled water. The solution is to be injected beneath the skin, care being taken to avoid puncturing a vein.

Q.—What are the most suitable localities for this method?

The external aspect of the arms and thighs, the abdomen, the back, and the calves of the legs. On the external aspect of the thigh, just in front of the great trochanter, there is an area of some two inches square over which the insertion of a fine hypodermic needle is not felt, so barren is the skin in that region of sensitive nerve filaments.

Q.—How can you be sure that the syringe contains no air?

By nearly filling it, and with the instrument held in a vertical position, point uppermost, the excess of solution over the amount required should be ejected. This will also prevent an overdose.

Q.—How are remedies administered into the circulation by the Skin?

By four methods: Enepidermic, Epidermic, Endermic, and Inoculation.

Q.—What is meant by *Enepidermic?*

This consists in placing the medicine in simple contact with the epidermis, no friction being used to hasten its penetration. They pass by osmosis.

Describe the *Epidermic* method.

This consists in the use of friction to promote the passage of the medicament between the cells of the epidermis.

The *Endermic* method.

This obviates the difficulty of absorption through the cuticle by removing the latter through the agency of a blister, and then powdering the medicament over the surface of the denuded derma.

Describe the process of *Inoculation.*

This consists of the introduction of medicinal agents through the scraped or punctured skin by an operation similar to that employed for vaccination.

DOSAGE.

Mention a general rule, as applied to all works on medicine, regulating the dosage.

As a rule the doses given are for adults. For children, Young's rule will be found the most convenient, and is as follows:

Add twelve to the age, and divide by the age to get the denominator of the fraction, the numerator of which is one. Thus, for a child two years old, $\frac{2+12}{2}=7$, and the dose is one-seventh of that for an adult.

Q.—Are there any exceptions this rule?

Yes. Of powerful narcotics scarcely more than one-half of this proportion should be used. Of mild cathartics two or even three times the proportion given may be employed.

Q.—If given hypodermatically, how should the dose compare?

About three-fourths of that used by the mouth should be employed.

Q.—If given per rectum?

About five-fourths of the same.

Mention some circumstances which, by modifying the effects, will influence the dose of medicine.

Age, sex, idiosyncrasy, constitution and habits of the patient, the condition of the digestive and absorbent systems, disease, and the manner of administration.

Q.—How do age, idiosyncrasy, constitution and habits influence medicinal effects?

Men generally bear larger doses of medicine than women; many persons manifest idiosyncrasies with respect to certain drugs; *i. e.* they are more or less susceptible to their effects. As a rule, the larger and more robust the individual, the less easily is he influenced by drugs. When a medicine is habitually taken the system becomes tolerant to it, and larger doses are required to produce any effect. This is especially the case with opium and purgatives.

Q.—In what way does the condition of the digestive and absorbent systems modify the effects of medicines?

During digestion larger amounts of medicine are borne than can be taken fasting. In certain conditions of the alimentary canal absorption from the stomach is slow, if it take place at all.

Q.—What effect does disease have on the influence of medicine?

In certain diseases great tolerance is manifested to medicine.

Q.—Does the administration modify the effect of medicines?

It does. Diuretics act more powerfully when much diluted, saline purgatives when concentrated. They act more rapidly by the mouth than by the rectum, and still more so when injected under the skin, most powerfully when injected into the blood.

Q.—In regard to the time or frequency of the doses have we any rules?

We have. The intervals between the doses should be so regulated that the second dose may be taken before the effect produced by the first is entirely effaced. Mercurial salts, arsenic, etc., are liable to accumulate in the system, and dangerous symptoms may arise if the doses rapidly succeed one another.

CLASSIFICATION OF REMEDIES.

Q.—In the present state of science is any scientific classification of the Materia Medica possible?

It is not. Writers are therefore justified in adopting any classification that may suit their fancy, or in adopting none.

Q.—In the light of our present knowledge what classification seems most scientific?

That based on their action on the principle functions.

Q.—What fact renders it difficult to properly group medicines?

The fact that as yet the study of pharmacology is in its infancy, so that the exact physiological group to which many of them belong is not definitely determined. The action of most medicines, also, is complex, affecting different organs at the same time, and in many instances varying much according to the dose and in the manner of administration

Give the six general divisions of remedies as suggested by Bartholow.

1st. Agents modifying the functions of the nervous system.

2d. Agents promoting constructive tissue metamorphosis (Tonics.)

3d. Agents promoting destructive metamorphosis (Alteratives).

4th. Agents causing some evacuation from the body.

5th. Agents preventing septic decomposition and growth of micro-organisms.

6th. Those acting locally only.

Give the Classification of Biddle.

1st. Neurotics, or those which have a special action on the nervous system.	Narcotics. Anæsthetics. Antispasmodics. Tonics. Astringents. Stimulants. Sedatives. Spinants.
2d. Eccritics, or those which have a special action on the secretions.	Emetics. Cathartics. Diaphoretics. Diuretics. Blennorrhetics. Emmenagogues.
3d. Hæmatics, or those which modify the blood.	Hæmatinics. Alteratives. Antacids.
4th. Those which act topically.	Antiseptics. Irritants. Demulcents. Coloring Agents. Authelmintics.

Q.—How does Shoemaker and Aulde classify medicines?

Into three general classes, viz: Those for *internal administration*, those for *external application*, and a third class embracing Antidotes, Disinfectants and Antiseptics. (*See table in their work.*)

Q.—How does Potter classify medicines?

Into two grand divisions, viz: *Stimulants and Sedatives*; stating that all other groupes are merely local applications of the two,

Q.—How does he subdivide these?

Into:—

1st. Agents acting on the *Nervous System.*
2d. Agents affecting the *Organs of Special Sense.*
3d. Agents acting on *Respiration.*
4th. Agents acting on the *Circulation.*
5th. Agents acting on the *Digestive System.*
6th. Agents affecting *Metabolism.*
7th. Agents acting on *Excretion.*
8th. Agents acting on the *Generative Apparatus.*
9th. Agents acting on the *Skin.*
10th. Agents acting on each other.
11th. Agents acting on *Microbes*, *Parasites*, etc.

Q.—What are Narcotics?

Medicinal substances which effect the cerebral and spinal functions by impairing or destroying nervous action.

Q.—What is the primary effect of Narcotics?

It is of a stimulant character, and their therapeutic efficacy is in a great degree due to this action.

Q.—How are Narcotics divided?

Into Anodynes (or Analgesics), and Soporifices (or Hypnotics).

Q.—When are they Anodynes?

When employed to relieve pain.

Q.—When are they Soporifices?

When employed to produce sleep

Q.—What effect does the continued use of Narcotics have upon the system?

Their influence is much diminished, and constantly increased amounts are called for to maintain the same effect.

Name some of the principal Narcotics.

Opium, Chloral, Belladonna, Tobacco, Aconite, etc.

Q.—What are Anæsthetics?

Medicinal substances which temporarily destroy sensation, thereby relieving pain.

Q.—How are Anæsthetics divided?

Into General and Local.

Q.—What are General Anæsthetics?

Those agents, or volatile substances capable of producing complete insensibility throughout the entire system, as Chloroform, Ether, etc.

Q.—What are Local Anæsthetics?

Those agents whose action is limited to a certain part when topically applied, paralyzing the nerves of the part and temporarily destroying the sensibility, as Cocaine, Aconite, etc.

Q.—What are Antispasmodics?

Agents which prevent or allay spasmodic action of voluntary or involuntary muscles in any portion of the organism.

Q.—How is this action produced?

By inhibiting the power of the higher over the lower nerve centres.

Mention some of the Antispasmodics.

Musk, Valerian, Asafœtida, Camphor, Alcohol, etc.

Q.—What are Tonics?

Medicinal agents which impart strength to the system, producing a gradual and permanent increase of nervous vigor, without preternatural excitement.

Q.—How may Tonics be divided?

They are divided into Vegetable and Mineral tonics.

Q.—What are Astringents?

Agents which produce contraction of muscular fibre, and condensation of other tissues. They also lessen secretion from mucous membranes.

Q.—How may Astringents be divided?

Into *remote* and *local* Astringents. The remote act on internal organs through the circulation, as Gallic Acid, Sulphuric Acid, and Acetate of Lead. The local

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affect the part to which they are applied, as Tannic Acid, Alum, the *per-salts* of Iron, etc.

Q.—What are Stimulants?

Agents capable of exciting a temporary and rapid exaltation of the organic actions, the excitation thus produced being extended or not to the rest of the system.

Q.—How are Stimulants divided?

Into *Diffusible* and *Aromatic*.

Define each.

Diffusible Stimulants are more powerful and rapid, as Alcohol, preparations of Ammonia, etc., while the Aromatic are milder, and are of a vegetable nature, containing a volatile oil. Among this class are Capsicum, Ginger, Peppermint, etc.

Q.—What are Sedatives?

Sedatives lower the functional activity of organs, lower motility, and diminish pain, and so exert a soothing influence on the system.

Q.—How are Sedatives divided?

Into *general* and *local* Sedatives.

Q.—What are Spinants?

Spinants, or Spastics, are medicinal agents employed to excite muscular contraction, such as Nux Vomica, Ergot, etc.

Q.—What are Emetics?

Agents which excite vomiting.

Q.—What are Cathartics?

Agents employed to evacuate the bowels.

Q.—How are Cathartics divided?

According to the intensity of their operation, into Laxatives, Purgatives, and Drastics, to which may also be added *Enemata*.

Q.—What are Diaphoretics?

Known also as *Sudorifics*, they are agents capable of producing perspiration, and an increase of the cutaneous discharge.

Q.—What are Diuretics?

Agents which act upon the kidneys, and produce an increased flow of urine.

Q.—What are Blennorrhetics?

Agents which increase the secretion of the mucous membranes. They are termed *Expectorants* when used to increase the secretion of mucus from the bronchial or laryngeal membranes.

Q.—What are Emmenagogues?

Agents which promote the menstrual discharge, or restore it when suppressed.

Q.—What are Hæmatinics?

Agents which increase the number of blood corpuscles, or the amount of hæmatin in the blood.

Q.—What are Alteratives?

Agents which are capable, when administered in small doses, of removing morbid structures and conditions without any sensible evacuation.

Q.—What are Antacids?

Medicinal substances capable of neutralizing acidity of the blood, or other secretions, by combining with the acid, and counteracting it.

Q.—What are Antizymotics?

Agents which arrest all fermentative processes, not only those due to the action of *Organic Ferments* (Diastase, Pepsin, Ptyalin, etc.), but also those depending on *Organized Ferments* (the Yeast Plant, Bacteria, Cocci, etc.)

Q.—How are they divided?

Into two groups, viz.: Antiseptics and Disinfectants.

Q.—What are Antiseptics?

Those agents which prevent or retard chemical change by destroying the activity of the infectious matter, the chemical composition of the body still, in many cases, remaining the same.

Q.—What are Disinfectants?

Those agents which decompose and remove the infectious matter itself.

Q.—What are Antipyretics?

Medicinal substances which reduce the temperature of the body when abnormally high.

Q.—How do these agents reduce the temperature?

By five different actions, working upon two principal lines, viz., by

- (*a*) Lessening heat production, by
  - 1st. Diminishing tissue change.
  - 2d. Reducing the circulation.
- (*b*) Promoting heat loss, by
  - 3d. Dilating cutaneous vessels, thus increasing heat, radiation.
  - 4th. Promoting perspiration, its evaporation lowering the temperature.
  - 5th. Abstracting heat from the body.

Q.—What are Irritants?

Agents employed to produce irritation or inflammation of the parts to which they are applied.

Q.—How are Irritants divided?

Into *Rubifacients*, *Epispastics* or *Vesicants*, *Suppurants* and *Escharotics* or *Caustics*.

Q.—What are Rubifacients?

Agents employed to redden the surface by exciting the action of the capillaries, and occasioning an afflux of blood to the part with which they come in contact.

Q.—What are Epispastics?

Agents capable of producing, when applied to the skin, inflammation followed by an effusion of serum beneath the cuticle.

Q.—What are Suppurants?

Agents which, when rubbed on the skin, cause an inflammation accompanied by a pustular eruption.

Q.—What are Escharotics?

Agents capable of destroying the structure and vitality of the parts which they come in contact with, either by abstracting its water or by corrosive oxidation.

Q.—How are Escharotics divided?

Into *Actual*, and *Potential;* the actual being fire itself, while the potential are medicinal substances.

Q.—What are Demulcents?

Sometimes called Lenitives, are medicines which soften and relax the tissue, and when applied to irritated or imflamed surfaces diminish heat, tension and pain.

Q.—What other terms or names are sometimes applied to Demulcents?

Emollients, Cataplasms and Poultices.

Q.—What are Anthelmintics?

Medicinal agents which promote the destruction and expulsion of worms from the alimentary canal.

Q.—How are they divided?

When employed simply to cause the expulsion of the parasite, they are *Vermifuges;* when they cause the death of the worm, *Vermicides.*

Q.—What are Coloring Agents?

Agents employed to impart their peculiar color to pharmaceutical preparations.

Q.—What are Mydriatics?

Agents which cause dilatation of the pupil (mydriasis).

Q.—What are Myotics?

Agents which produce contraction of the pupil (myosis).

Q.—What are Errhines and Sternutatories?

Agents which produce sneezing and an increase of the nasal secretion. The first term is usually applied to substances which simply increase the mucous discharge; the second to those which invariably produce the violent expiratory effect called sneezing.

Q.—What are Dentifrices?

Medicated pastes, powders, or washes, employed with a brush to cleanse the teeth and gums.

Q.—What are Sialagoues?

Agents which promote the secretion and flow of saliva and buccal mucus.

Q.—What are Antisialics?

Agents which diminish the secretion of the salivary and buccal glands.

Q.—What are Anhidrotics?

Agents which check perspiration.

Q.—What are Aphrodisiacs?

Agents which stimulate the sexual appetite and function.

Q.—What are Anaphrodisiacs?

Agents which diminish the sexual appetite and lower its functional power.

Q.—What are Oxytocics, or Ecbolics?

Agents which produce abortion by stimulating the gravid uterus to contract upon its contents.

Q.—What are Galactagogues?

Agents which are supposed to increase the lacteal secretion.

Q.—What are Galactophyga?

Remedies which arrest the secretion of milk.

Q.—What are Antidotes?

Agents which act upon poisons in such a manner as to alter their composition, rendering them more or less innocuous, and so *preventing* their toxic action being exerted upon the organism.

Q.—What are Antagonists?

Agents which directly oppose each other in some or all of their physiological actions, thereby *counteracting* the effect of the poison on the organism.

Q—What are Styptics?

Agents employed externally for the arrest of hemorrhage, and belong to the class of astringents.

PART II.

MATERIA MEDICA AND THERAPEUTICS.

NEUROTICS.

Q.—How is the class of Neurotics divided?

Into:—

Motor and Cerebral Excitants, and Motor and Cerebral Depressants.

What remedies are classed as Motor-Excitants?

Electricity.
Cimicifuga
Picrotoxin
Scoparius.
Duboisia
Convallaria.
Ignatia.
Strophanthus.
Digitalis.
Stramonium.
Nux Vomica.
Belladonna.
Ergota.
Scilla.
Hyoscyamus.

ELECTRICITY.

Q.—What is Electricity?

A powerful physical agent which makes its existence manifest by attractions and repulsions, by producing light and heat, commotions, chemical decomposition, and other phenomena.

Q.—What forms of electrical force are employed in medical practice?

Magnetism, Static electricity (also known as Franklinism), Galvanism and Faradism.

Q.—What is Static electricity?

That produced by friction.

Q.—What is Magnetism?

Magnetism is a sort of static charge which many bodies are capable of assuming, either under the influence of an electric current or by contact.

Q.—What is Galvanism?

It is that form of electricity produced by chemical action.

Q.—What is Faradism?

Faradism, or electro-magnetism, and magneto-electricity, is *induced electricity*; *i.e.* the current of electricity from one or more galvanic cells is passed through a coil of wire, whereby the galvanic properties are modified and practically a new current is obtained. It is called the *Induced, Interrupted*, or *Faradic* current.

Q.—What general term is applied to, and includes Galvanism and Faradism?

Dynamic electricity; *i. e.* free electricity, moving as a current.

Q.—What is a Battery?

It is the name applied to the apparatus complete, for the production of electricity.

Q.—What is a Cell?

The jar, cup, or other container which holds the elements and agents which produce a difference of potential between them.

Q.—What is a Current?

The transfer of electrical energy along a conductor. It is commonly spoken of as flowing from the positive to the negative points in the circuit.

Q.—What are the Poles of the battery?

Points where electricity passes in and out.

Q.—How are they designated?

As the Positive Pole or Anode, and the Negative Pole or Cathode.

Q.—What is meant by the Positive Pole, or Anode?

The "way" or path by which the electric current passes out and enters the electrolyte on its way to the other pole.

Q.—What is meant by the Negative Pole, or Cathode?

That part of the battery by which the electric current leaves substances through which it has passed, or the surface at which the electric current passes out of the electrolyte.

Q.—What is meant by Electrolyte?

The compound in the bath which is decomposed by the electric action, or more simply, the body acted upon by electrolysis.

Q.—What is meant by Electrolysis?

The separation of a chemical substance into its elements by electricity.

Q.—What is meant by Electrodes?

The instruments fastened to the conducting cords that are used in applying electricity to the human body.

Q.—What are the elements of a battery?

The metals, or carbon and metals, immersed in battery fluid to generate a current of electricity.

Q.—What is the force generated by a battery called?

Electro-motive force.

Q.—What precise terms have been devised for the proper study of electricity?

A *Volt*, an *Ohm*, an *Ampere*, a *Farad*, a *Coulomb*.

Q.—What is a Volt?

The unit of electro-motive force.

Q.—What is an Ohm?

The unit of resistance.

Q.—What is an Ampere?

The unit of current-strength.

Q.—What is a Farad?

The unit of capacity.

Q.—What is a Coulomb?

The unit of quantity.

Q.—What are Dynamos?

By the rapid rotation of a coil of wire containing cores of wrought iron before magnets, powerful currents of electricity may be generated. Such machines are called "Dynamos" and are used for electric lighting and heating. By reversing the arrangement and heading a current into the coils of wire a rotation is caused, and upon this principle is based the electric motors used for drills and pluggers.

Q.—What conclusions have been reached by scientists in regard to the human body and its possession of electricity?

1st. The human body always possesses electricity, but its strength is not the same in all; in some it is *positive*, and in some it is *negative*.

2d. The intensity and nature often varies in one and the same person.

3d. The natural electricity of the body is positive, for this is always its character when there has been no violent exertion.

4th. This normal positive electricity is changed into negative by exposure to cold, or else is greatly enfeebled.

5th. The same change occurs from over exertion or lassitude.

6th. The natural electricity is also changed into negative by sudden, rapid and violent motion.

7th. Prolonged mental exertion increases positive electricity.

8th. Positive electricity is increased in winter and diminished in summer, ceasing entirely during perspiration.

9th. This electricity in not due to the friction of the clothing, since it was still observed after remaining for hours on an insulated stool without clothing.

Q.—What is the physiological action of electricity?

Electricity stimulates muscular action, either when applied directly or through the nerves supplying the muscles.

Q.—When does this action occur?

At the opening or closing of the circuit.

Q.—What are the effects of electric stimulation of the Spinal Cord?

The results are according to the functional powers of the part, pain when the sensory tract is irritated, and muscular movements when the motor is acted upon.

Q.—What effect has the excitation of that part of the cord between the fifth cervical and tenth dorsal vertebræ?

Dilatation of the pupil, the region is therefore known as the *Cilio-spinal region*.

Q.—What portion of the cord is known as the *Genito-spinal region*, and why?

The lumbar part, as excitation at this point is reflected to the genital apparatus.

Q.—What effect has the Galvanic and Faradic current upon the Pneumogastric?

A weak galvanic current sent through the pneumogastric increases the force and rapidity of the heart's movements; but a strong current arrests the heart in diastole. A Faradic current produces the same result, but more decidedly when applied directly to the nerve; applied through the tissues it has no apparent effect.

Q.—What is the action of these currents on the sympathetic system?

Covered by the tissues the ganglia and fibres of the cervical sympathetic are not acted upon by Faradic and static electricity, but even a weak galvanic current does effect them. Applied directly to the sympathetic nerves the effect of Faradism is tetanizing, and the vessels receiving their innervation from this source contract very strongly.

Q.—What effect will currents of electricity have on morbid growths?

They are used to promote decomposition by the chemical action—electrolysis.

Q.—What is the therapy of electricity?

Electricity in its various forms has been extensively applied in medicine, the cases treated including almost all forms of disease in the brain and nervous system.

Q.—In what special forms of disease does it seem indicated?

The various forms of paralysis, neuralgia, spasmodic affections and even affections not directly nervous, such as anæmia, dyspepsia, chlorosis, rheumatism, etc. It is also of great value as a stimulant in cases of suspended animation.

Q.—How would you treat a case of Tic-douloureux by galvanization?

The best method is that advised by Onimus and Legros (Bartholow). Place the positive pole on the point of the emergence of the fifth nerve, and the negative over the superior ganglion of the cervical sympathetic. About ten elements of Siemens and Kalske is the proper strength, and five to eight minutes the proper time for these applications.

Q.—What affections of the skin are treated by galvanism?

Herpes and prurigo, when referable to an alteration of the cutaneous nerves. Also some cases of eczema, acne, and the neuroses of the skin have been successfully treated.

Q.—How is electricity utilized by the dentist?

In the office and laboratory it is used as a power to propel lathe or engine, etc., to produce light and heat; for diagnostic purposes and the production of anæsthesia. In certain pathological conditions electricity is employed to produce absorption and change in the structure of the different tissues, to stimulate secretion, and to influence circulation.

Q.—What is Galvano-Cautery?

A current if passed through a resisting body, such as a fine wire, is converted into heat. A platinum wire loop is usually employed and by this means we are enabled to cut through tissues without much bleeding.

Q.—How is this same principle applied to the treatment of pulpless roots?

As an agent for abstracting all moisture, thereby destroying one of the elements necessary to microbic life.

Q.—How is this same principle used for diagnostic purposes?

Recent improvements have rendered possible portable electric lamps, which, properly protected, can be made to illuminate the oral cavity, which in a normal condition will be found partially transparent. Any pathological condition, as a dead pulp, pus or other deposits, will destroy this transparency.

Q.—For what anæsthetic purpose has electricity been suggested?

For the painless extraction of teeth. The results, howeved, have not been sufficiently encouraging to warrant its extensive employment.

NUX VOMICA.

Q.—What is Nux Vomica?

Strychnos Nux Vomica, or Poison Nut (Nat. Ord Loganiaceæ) is a medium sized tree of India, which bears a round smooth berry, the size of a large apple, of a rich orange color, and containing numerous seeds imbedded in a juicy pulp.

Q.—What portion of the plant is official?

The seed. The bark is also poisonous and is known as *false angustura bark*.

Q.—What active principles does it contain?

It contains two alkaloids, *strychnine* and *brucine* combined with *igasuric acid*, and according to some investigators, a third alkaloid, *igasurine*, has been discovered.

Q.—In what proportion do these alkaloids appear?

Strychnine ranges from one-fourth to one-half of one per cent, and brucine from one-eighth to one per cent.

Q.—What are the physical properties of strychnine?

It is a white, or grayish white powder, of an intensely bitter taste, nearly insoluble in water, slightly soluble in cold alcohol, and readily soluble in boiling alcohol. Strong heat wholly dissipates it. It is slightly, or not at all reddened by nitric acid.

Q.—How may the presence of these alkaloids be detected?

A small portion of strychnine dissolved in official sulphuric acid yields, on the addition of a minute quantity of bichromate of potassium, a violet color. Brucine produces a blood red when added to nitric acid, afterwards turning yellow. The physiological test would be the production of tetanic spasms in a small animal (preferably a frog) to whom a minute amount of the suspected substance has been administered.

Q.—What salt of strychnine is mostly used?

The sulphate, owing to its ready solubility,

Q.—What is the treatment for strychnine poisoning?

Evacuate the contents of the stomach by emetics or the stomach pump before the convulsive stage, or washing out the stomach under ether or chloroform if not seen before the convulsions have begun; give tannic acid as a chemical antidote, and chloral (hypodermatically) as an antagonist. Perfect quiet is essential, and the frequent use of the catheter to prevent resorption of the poison from the bladder.

Q.—What are the physiological effects of Nux Vomica?

Identical with those of its alkaloids. The action of brucine is similar to, but much weaker than strychnine. In small doses nux vomica acts as a bitter tonic, stimulates respiration, secretion, appetite and digestion, and sharpens the vision. In large doses it causes malaise, restlessness, anxiety, muscular twitchings and finally clonic convulsions. Strychnine acts principally on the spinal cord, stimulating especially its reflex, but also its motor, vaso-motor and sensory functions. It does not affect the brain directly. It is eliminated unchanged in the urine.

Q.—What are the therapeutic uses of Nux Vomica and Strychnine?

They hold the first rank as respiratory, cardiac, muscular and nervous stimulants, and as stomachic tonics. These powerful poisons are also powerful remedies in atonic dyspepsia, gastric catarrh, opium poisoning, constipation, due to atony of the bowels, diarrhea and dysentery, anæmia and chlorosis, tetanus, neuralgia, local paralysis, diphtheritic paralysis, amaurosis, cardiac failure from any cause, dyspnœa intermittent, and nervous cough.

Q.—What are the Dental uses of Strychnine?

In cases of neuralgia, the causes of which are supposed to be constitutional, in cases of paralysis and paresis, and for its general tonic effect strychnine becomes a valuable addition to dental medicine.

Q.—What are the official preparations of Nux Vomica and Strychnine?

Abstractum Nucis Vomicæ,	dose gr. ss.—j.
Extractum Nucis Vomicæ,	dose gr. ⅛—½.
Extractum Nucis Vomicæ Fluidum,	dose ♏j —v.
Tinctura Nucis Vomicæ,	dose ♏ v—x.
Strychnina (Strychnine),	dose gr. 1-60—1-20.
Strychninæ Sulphas,	dose gr. 1-60—1-20.
Brucina (not official),	dose gr. 1-10—⅓.

IGNATIA—St. Ignatius Bean.

Q.—What is Ignatia?

Ignatia is the seed of *Strychnos Ignatia,* or St. Ignatius' Bean (Nat. Ord. Loganaceæ), a tree of the Phillipine Islands. It is also called Ignatia Amara, contains a large quantity of strychnine, and some brucine, and possesses medicinal properties analogous to those of nux vomica.

Q.—What are its therapeutic uses?

The same as nux vomica, but is rather more powerful.

Q.—What are the official preparations?

Abstractum Ignatiæ,	dose gr. ¼—j.
Tinctura Ignatiæ,	dose ♏ v.—xx.

PICROTOXIN—Fish Poison.

Q.—What is Picrotoxin?

Picrotoxin is a neutral principle from the berries (Cocculus Indicus) of the *Anamirta paniculata*, an East India plant.

Q.—What are its physical properties?

White bitter crystals, slightly soluble in water.

Q.—What is the dose of Picrotoxin?

From gr. $\frac{1}{60}$ to $\frac{1}{30}$.

Q.—What is the physiological action of Picrotoxin?

Picrotoxin is a cerebro-spinal stimulant, it increases all the secretions and causes nausea and vomiting.

Q.—What are the therapeutic uses of Picrotoxin?

In cases of epilepsy and various paralytic affections it is used; also in night sweats, colic and painful dyspepsia.

Q.—What are the antagonists of Picrotoxin?

Chloral antagonizes its cerebro-spinal effects, and anæsthetics control the spasmodic action.

ERGOTA—Ergot of Rye.

Q.—What is Ergot?

Ergot is a fungus growing from the diseased ovary of *Secale Cereale*, or Rye (Nat. Ord. Graminaceæ).

Q.—What does it contain?

The exact chemical composition of Ergot is still a matter of doubt, but the latest researches seem to show that it contains a resinoid substance, *Sphacelinic acid*, and a neutral principle, *Cornutin*, which together represent the value of the drug. It also contains an alkaloid, *Ergotinine*.

Q.—What are the physiological effects of Ergot?

Ergot possesses the property of causing contraction of the unstriped muscular fibre wherever found, causing a shrinkage in the caliber of the blood vessels *every where*. It is thus available generally as a remedy in cerebral and spinal congestions, hemorrhages, tumors, morbid growths and enlargements. Its effects upon the nervous system are not well understood, but in medicinal doses its effects upon the circulation and the uterus are most conspicuous. Large doses cause nausea and vomiting, increased peristalsis and purging. Toxic doses depress the heart by acting directly on its muscle or coating ganglia, and lowers the blood pressure partly by its action on the heart, and partly from depression of the vaso-motor centres.

Q.—What are its medicinal uses?

As an oxytocic in *small doses* in uterine inertia in the second stages of labor, when there is no resistance; to prevent post-partum hemorrhage; to induce premature labor; to prevent hemorrhage after abortion. As a hæmostatic, where surgical means of arrest cannot be employed, and as an adjuvant to their local treatment. Ergot is beneficially exhibited in inflammations of the mucous membranes generally, in menorrhagia, epistaxis, hemorrhage from the gums and all internal hemorrhages, though most beneficial in those of an arterial type.

Q.—When is Ergot of assistance to the dentist?

In cases of obstinate or long continued hemorrhages, especially those that can not be governed by local treatment: also in cases of hemorrhagic diathesis or hemophilia. In cases of cerebral congestion manifesting itself by pain in dental tissues it is also of salutary assistance.

Q.—What agents are antagonistic to the action of Ergot?

Amyl nitrite, Aconite, Veratrum Viride and Tobacco.

Q.—What are the official preparations?

Extractum Ergotæ Fluidum,	dose fʒss—ij or more.
Extractum Ergotæ,	dose gr. v—xv.
Vinum Ergotæ,	dose fʒj—iv.

DIGITALIS—Fox Glove.

Q.—What is Digitalis?

Digitalis is the leaves of *D. purpurea*, or purple foxglove (Nat. Ord. Scrophulariaceæ), obtained from plants of the second years growth. It is a European plant, cultivated in this country.

Q.—What are its chemical constituents?

It is said to contain several glucosides called *digitalin*, *digitoxin* and *digitalein*, which are supposed to possess identical properties with those of the crude drug, and *digitanin*, which is said to resemble saponin in its effects. The chemistry of digitalis is in a very confused state.

Q.—What are its physiological effects?

Digitalis is a cardiac tonic and a vascular stimulant, an excito-motor, a paralysant, an anaphrodisiac, a diuretic and an emetic. It lowers temperature, probably by lessening the blood supply to the tissues, produces headache, irregularity of the heart's action, and an appearance of vibratory fringes of color around objects. The heart is slowed by digitalis, but its force is at the same time increased.

Q.—How does the action of Digitalis and Aconite compare?

Aconite relaxes the inhibition, but depresses the cardiac motor ganglia; Digitalis increases inhibition, and stimulates the motor apparatus. Both drugs finally paralyze the heart. Aconite by direct depression, Digitalis by over stimulation. Both drugs depress the cardiac muscle. Under Aconite the heart is arrested in diastole; under Digitalis in systole.

Q.—What are the antidotes and antagonists of Digitalis?

The chemical antidote is Tannic Acid, but as the tannate is not inert, the stomach should be evacuated. Alcohol, ammonium carbonate, and opium, or saponin are physiological antagonists.

Q.—What are the medicinal uses of Digitalis?

As a cardiac tonic Digitalis is used in all cases of loss of cardiac power, as in dilatation, or in weakness of the cardiac muscle. The tincture (♏ x—xx) may be employed hypodermatically in cases of *sudden* heart failure. To sustain the action of a depressed heart in various acute diseases, particularly in pneumonia, it is often administered. In delirium tremens, as an antidote to poisoning by aconite, etc., to contract the blood vessels in acute inflammations and hemorrhages.

Q.—What are the official preparations of Digitalis, and how are they administered?

Abstractum Digitalis,	dose gr. ss--j.
Extractum Digitalis (gradually increased),	dose gr. ¼—½.
Extractum Digitalis Fluidum,	dose ♏j—iii.
Tinctura Digitalis (gradually increased)	dose ♏v—xxx.
Infusum Digitalis (one of the best preparations),	dose fʒ ss—iv.

The action of Digitalis is cumulative, therefore, caution should be used.

Q.—What are the Dental uses of Digitalis?

Owing to its power of producing arterial contraction, Digitalis may be usefully employed as a hæmostatic in the hemorrhagic diathesis, or in traumatic hemorrhages; also as a cardiac stimulant in cases of sudden heart failure.

CONVALLARIA—Lily of the Valley.

Q.—What is Convallaria?

The herb of the *Convallaria Majalis*, "Lily of the Valley."

Q.—Is it official?

No. But it has attracted attention as an analogue of digitalis, but less dangerous in its action.

Q.—What preparations are made?

An extract,	dose gr. ij—xv, also
A fluid extract,	dose ♏ ij—x, and
An infusion,	dose ℥ ss—ij.

Q.—What are its physiological actions and therapy?

Similar to digitalis, but safer.

CIMICIFUGA—Black Snake Root.

Q.—What is Cimicifuga?

Cimicifuga is the rhizome and rootlets of *C. racemosa*, Black Snake Root, or Cohosh (Nat. Ord. Ranunculaceæ), an indigenous plant.

Q.—What does it contain?

A volatile oil, two resins, tannic acid, etc. The active principle has not been isolated.

Q.—What are its physiological actions?

Cimicifuga is anti-spasmodic, aphrodisiac, diaphoretic, diuretic, and expectorant. It acts similar to digitalis on the heart and circulation, and similarly to ergot on unstriped muscular fibre, but is much feebler in activity than either. Its taste is bitter and nauseous resembling that of opium.

Q.—What is its therapy?

Not often prescribed, but is sometimes used as a cardiac tonic, as a diuretic in dropsies, as an expectorant in chronic bronchitis, and as an anti-spasmodic in chorea. In neuralgias of congestive type it is claimed to be beneficial.

BELLADONNA—Deadly Night Shade.

Q.—What is Belladonna?

Belladonna is the leaves and the root of *Atropa Belladonna*, or Deadly Night Shade (Nat. Ord. Solanaceæ), a European plant, cultivated in this country.

Q.—Upon what does the medicinal value of Belladonna depend?

Substantially upon an alkaloid, *Atropina*.

Q.—What salt of Atropine is official?

The sulphate, *Atropina Sulphas* $(C_{17}H_{23}NO_3)_2H_2SO_4$.

Q.—What are the tests for Atropine?

A delicate test is the addition of hydrobromic acid, which produces a yellow, amorphous precipitate, soon becoming crystalline. The *physiological test* (viz., the dilatation of the pupil in the lower animals after the local application of the suspected solution) should always be resorted to.

Q.—Into what is Atropine resolvable?

Into *Tropin* and *Tropic acid.*

Q.—What is Homatropine?

This is obtained by the action of dilute hydrochloric acid upon the amygdalate of tropin, and is used by opthalmologists as a hydrobromate of homatropine.

Q.—What are the antidotes and antagonists of Atropine?

In poisoning by Atropine, tannic acid and emetics should be used. *Pilocarpine,* physostigmine, or morphine are partial antagonists.

Q.—What are the physiological effects of Belladonna and its alkaloids?

Belladonna is an irritant narcotic, a mydriatic, an anti-spasmodic and an anodyne; applied locally to the skin, or mucous membrane it is absorbed, lessens the sensibility of the sensory nerves and produces constitutional effects. In small doses, internally, a cardiac, respiratory and spinal stimulant; in large doses a paralyzer of the secretory and motor nerve endings and a stimulator of the entire sympathetic system. It produces dryness of the mucous membranes of the throat, mouth, nose and larynx, and at first lessens the gastric and intestinal secretions, but soon reproduces them in large quantities. The cardiac action is at first slowed if the dose be small, (from stimulation of the inhibitory centre) but is soon quickened (from progressive paralysis of the peripheral filaments of the vagus and stimulation of the cardio-accelerator centre or nerves). The pupils are dilated by the local or systemic use of the drug by stimulation of the end organs of the sympathetic and paralysis of those of the motor oculi.

Q.—What effect has Belladonna on the brain?

The brain is congested, a busy delirium being produced and hallucinations with mental disorder, due to a selective action on the cells of the gray matter.

Q.—What effect on the Spinal Cord?

Stimulation from the second cervical vertebra to the tenth dorsal, resulting in paralysis of the motor nerves, central and peripheral. Sensation is slightly impaired, muscular irritability is not.

Q.—What effect upon constructive metamorphosis?

Owing to increased circulation, it is greatly promoted.

Q—What effect upon the skin?

It arrests the secretions of the skin; it becomes dry, and a scarlatinoid rash appears, from large doses.

Q.—How is Belladonna eliminated?

Principally by the kidneys.

Q.—What are its medicinal uses?

Belladonna is useful as an anodyne in various neuralgias, either locally or given by the mouth, rectum or subcutaneously; often combined with morphine. In muscular rheumatism and in myalgia, in conjunctivitis and iritis; as an antispasmodic, it is used to relax spasms and allay pain in lead colic, spasmodic diarrhea and cramps of the bowels, bladder and urethra, in asthma, laryngysmus stridulus and whooping cough, in habitual constipation, in incontinence of urine in children; as a cardiac and vaso-motor stimulant in all cases of threatened collapse from heart failure, and is highly recommended to contract the blood vessels in acute inflammatory affections generally. To check excessive secretion, as in salivation, excessive sweating, etc. As a respiratory stimulant in opium poisoning, and poisoning from other substances.

Q.—What are the Dental uses of Atropine?

In dental practice it is used locally as an obtunding agent, etc., and internally for neuralgia, etc. Combined with morphine it is servicible in allaying extreme nervous excitement in that class of patients deemed unapproachable.

Q.—What are the preparations of Belladonna and Atropia?

From the leaves:—

Extractum Belladonnæ Alcoholicum,	dose gr. 1-40—j.
Tinctura Belladonnæ (15 per cent.),	dose ♏v—xx.
Unguentum Belladonnæ (10 per cent.).	

From the root:—

Abstractum Belladonnæ.	dose gr. 1-10—j.
Extractum Belladonnæ Fluidum,	dose ♏ 1-10—ij.
Linimentum Belladonnæ.	
Emplastrum Belladonnæ.	

Active Principles:—

Atropina,	dose gr. 1-200—1-60.
Atropina Sulphas,	dose gr. 1-200—1-60.
Homatropine (unofficial).	
Benzoyl—tropine (unofficial).	

STROPHANTHUS. (Unofficial.)

Q—What is Strophanthus?

The seeds of *Strophanthus Hispidus*. An African climbing plant (Nat. Ord. Apocynaceæ), (not official.)

Q.—To what is its medicinal action due?

To a crystalline glucoside named *Strophanthin*.

Q.—What are its physiological actions and therapy?

The same as digitalis, Strophanthus differing in not contracting arterioles and in not being cumulative, though acting more rapidly.

Q.—What are its preparations?

Tinctura Strophanthi,	dose ♏v—x.
Strophanthinum,	dose gr.1-120—1-60.

SCOPARIUS—Broom.

Q.—What is Scoparius?

The tops of *Sarothamnus Scoparius*, the common "Broom," a well known garden plant (Nat. Ord. Leguminosæ).

Q.—What does it contain?

It contains a neutral, crystalline principle named *Scoparin* and a liquid volatile, poisonous alkaloid, *Sparteine*, which contains no oxygen, but has decided basic qualities.

Q.—What is the physiological action of these remedies?

Broom tops are diuretic and laxative, also emetic and cathartic in large doses. Sparteine is a cardiac tonic and used in those cases requiring stimulation of the heart's action with the smallest possible increase of arterial tension. It has been highly recommended lately in the treatment of the opium habit.

Q.—What are its preparations?

Decoctum Scoparii (unofficial),	dose ℥j—iij.
Sparteinæ Sulphas (unofficial),	dose gr. 1-2—ij.

SCILLA—Squill.

Q.—What is Squill?

Squill is the sliced bulb of *Urginea Scilla*, or *Scilla Maritima*, a perenial plant (Nat. Ord. Liliaceæ) growing along the shores of the mediterranean.

Q.—What does it contain?

Its active principle is probably the acrid, bitter glucoside, *Scillitoxin* or *Scillain*, which it contains along with *Scillipicrin*, *Scillitin*, *Scillin*, *Sinistrin*, etc.

Q.—What are the physiological actions of Squill?

In small doses, expectorant, in large ones, emetic and diuretic. In medicinal doses it acts upon the circulation like digitalis.

Q.—What is its Therapy?

Mostly as an expectorant and diuretic, though it renders excellent service as a cardiac stimulant; much used among children in coughs and bronchial troubles.

Q.—What are its preparations?

Extractum Scillæ Fluidum,	dose ♏ j. iij.
Tinctura Scillæ,	dose ♏ v—x xx.
Acetum Scillæ,	dose ♏ x—ʒj.
Syrupus Scillæ,	dose ʒss—ij.
Syrupus Scillæ Compositus (Cox's Hive Mixture),	dose ♏ x—xxx.

DUBOISIA.

Q.—What is Duboisia?

The leaves of *D. myoporoides* (Nat. Ord. Solanaceæ), a shrub of Austria.

Q.—What does it contain?

An alkaloid *Duboisine*, isomeric with atropine, hyoscyamine, etc.

Q.—What are its physiological actions?

Given internally it dilates the pupil, stimulates the respiratory centres, and depresses the inhibitory cardiac ganglia; thus causing increase in frequency, both of the respiration and cardiac action. Locally applied to the conjunctival sac it paralyses accommodation and dilates the pupil more rapidly but for a shorter time than atropine and is less irritating. It is used as a substitute for atropine in ophthalmic practice.

Q.—What are its preparations?

Extractum Duboisiæ,	dose gr. 1-6—¼.
Tinctura Duboisiæ,	dose gtt. v—xx.
Duboisinæ Sulphas,	dose gr. 1-100—1-60.

STRAMONIUM—Thorn Apple.

Q.—What is Stramonium?

The leaves and the seeds of *Datura Stramonium* (Nat. Ord. Solanaceæ), a bushy indigenous plant.

Q.—What does it contain?

An alkaloid, *Daturine* probably identical with atropine, also *Malic acid*.

Q.—What is its common name?

"Jamestown," or "Jimson" weed.

Q.—What are its physiological effects?

In almost every respect similar to those of belladonna, Stramonium being more powerful, acting chiefly on the sympathetic system, not affecting the motor or sensory nerves. It is not a popular remedy owing to the delirium it produces.

Q.—What is its Therapy?

Similar to Belladonna. The leaves are sometimes smoked in asthma, and an ointment made of same is applied to ulcers of irritable character.

Q.—What are its preparations?

Extractum Stramonii,	dose gr. ¼—½.
Extractum Stramonii Fluidum,	dose ♏ j—iv.
Tinctura Stramonii,	dose ♏ x—xxx.
Unguentum Stramonii,	

HYOSCYAMUS—Henbane.

Q.—What is Hyoscyamus?

The leaves of *H. Niger* (Nat. Ord. Solanaceæ), a native of Europe.

Q.—What does it contain?

Two alkaloids, *Hyoscyamine* and *Hyoscine*, both of which are isomeric with atropine and daturine.

Q.—What incompatible is frequently prescribed with Hyoscyamus?

Liquor Potassæ. All the fixed caustic alkalies destroy its alkaloid, as well as those of allied plants.

Q.—What are its physiological effects?

Similar to those of atropine, duboisine, daturine, except that it is the least powerful and least irritant of the group, and the most calmative and hypnotic. It is more stimulant to the vaso-motor system and the cardiac accelerator apparatus than is daturine, but it is less active on the pneumogastric. Hyoscine is still less active and less irritant, is decidedly anodyne and hypnotic, and very depressant to the respiration.

Q.—What is its Therapy?

Principally used as a hypnotic and anodyne when opium is contra-indicated.

Q.—What are its preparations?

Abstractum Hyoscyami,	dose gr. ss—ij.
Extractum Hyoscyami Alcoholicum,	dose gr. 1-6—j
Extractum Hyoscyami Fluidum,	dose ♏ j—v.
Tinctura Hyoscyami,	dose fʒ ss—j.
Hyoscyaminæ Sulphas,	dose gr. 1-100—1-50.
Hyoscinæ Hydrobromas,	dose gr. 1-150—1-80.

CEREBRAL EXCITANTS.

Q—What remedies are classed as Cerebral Excitants?

Camphor.
Coca.
Valerian.
Cannabis.
Ammoniac.
Theine.
Asafœtida.
Caffeine.
Serpentaria.
Stimulant Beverages

CAMPHORA—Camphor.

Q.—What is Camphor?

Camphor is a concrete, volatile, waxy solid, from the volatile oil of *Cinnamomum Camphora*, a tree indigenous in China, Japan, Borneo, etc.

Q.—What are its physical properties?

A translucent crystalline mass, very slightly soluble in alcohol, ether, chloroform, carbon bi-sulphide. oils and milk.

Q.—What is its chemical formula?

$C_{10}H_{16}O$.

Q.—What are its derivatives?

Camphor-Cymol, by distillation with zinc chloride. *Camphoric* and *Camphretic acids* result respectively from its lesser or greater oxidation.

Q.—What are its antagonists and incompatibles?

Water precipitates camphor from its spirituous solution. Alkaline and earthy salts separate from its solution the small quantity of camphor contained in aqua camphoræ. Coffee, the arterial sedatives, cold and depressing causes generally, antagonize it physiologically.

Q.—What are its synergists?

Alcohol, opium and narcotic substances, together with all cerebral excitants increase the action of camphor.

Q.—What are the physiological effects of Camphor?

Camphor locally applied is an irritant. It is classed as antispasmodic, anodyne, antiseptic, diaphoretic, a stimulant expectorant, a cerebral excitant, a gastro-intestinal irritant and a counter irritant. In *medicinal* doses it stimulates the vaso-motor system and the cardiac motor ganglia, and lessens the influence of the pneumogastric, thus increasing the circulation and raising the arterial tension; stimulates respiration, mental activity, promotes perspiration, allays pain, increases the menstrual flow and the sexual appetite, but its continued use depresses the generative function. Large doses depress the heart, lower arterial tension and diminish the reflex function of the cord.

Q.—How is Camphor eliminated?

By the bronchial mucous membrane, skin and kidneys.

Q.—What is its Therapy?

Camphor is employed as an antispasmodic in "*nervousness*," *nervous head-ache*, hysterical complaint, dysmenorrhœa, "*after-pains*," diarrhea and cholera. As an anaphrodisiac in chordee, nymphomania, priapism, etc.

Q—What are its dental uses?

As a local anodyne and local anæsthetic camphor has been employed with varying degrees of success. The spirit of camphor to sensitive dentine relieves its irritability, allays the "after-pains" of extraction from highly inflamed alveoli. For this purpose, combined with chloroform, it is more efficient (Camphor ʒj Chloroform ʒij). In cases of recent extirpation of pulp followed by pain and hemorrhage, the application of the spirits is gratefully received. Combined with equal parts of tinct. myrrh, the astringent and antiseptic properties are increased. Combined with equal parts of chloral hydrate it forms an efficient anodyne liniment; in cases of neuralgia or pericemental tension. Combined with carbolic acid (campho-phenique), the antiseptic and anodyne effects of both are increased, while the irritating properties are diminished, making a valuable dressing to pulpless roots, abscesses, phagedenic pericementitis, etc. Combined with ether (Pulv. Camphoræ ʒvj ætheris f℥j), it has been used as a local anæsthetic in extraction, applied to gums until the tissue blanches. The monobromated camphor is employed as a sedative in convulsions of dentition, neuralgia, etc. Camphor is an ingredient of celluloid.

Q.—What are its preparations and dosage?

Camphora,	dose gr. j–x
Aqua Camphoræ. (strength 1 to 125)	dose fʒss–ij
Spiritus Camphoræ, (strength 10 per cent.)	dose ♏v–ʒj
Linimentum Camphoræ, (⅓ of cotton seed oil).	
Ceratum Camphoræ.	
Linimentum Saponis.	
Camphora Monobromata, gr. v–x in-emulsion.	
Campho-phenique.	

ASAFŒTIDA.

Q.—What is Asafœtida?

A fetid gum resin obtained from the living root of *Ferula Narthex* and *Ferula Scorodosma*, Afghan plants (Nat. Ord. Umbelliferæ).

Q.—Of what is it composed?

A gum and a resin, with Feruliac, Malic, Acetic, Formic, and Valerianic acids.

Q.—What are its physiological actions?

Asafœtida is a powerful antispasmodic, a nerve and cerebral stimulant, a stimulating expectorant. It is also tonic, laxative, diuretic, diaphoretic, emmenagogue, aphrodisiac and anthelmintic.

Q.—What is its Therapy?

Flatulent colic of infants, infantile convulsions, hysteria and hypochondriasis, bronchial affections, catarrhs, etc. Its taste and odor interfere with its use.

Q.—What are its preparations?

Mistura Asafœtidæ,	dose ℥ss—ij
Tinctura Asafœtidæ,	dose ʒss—ij

Q.—What is Dewee's Carminative?

Technically, *Mistura Magnesiæ et Asafœtidæ*, a mixture of magnesia and asafœtida. Contains magnesia carbonate, 5 per cent.; tincture of asafœtida 7 per cent.; tincture of opium 1 per cent.; sugar and distilled water· dosefʒj–iv.

AMMONIACUM—Ammoniac.

Q.—What is Ammoniac?

A spontaneous *Gum-Resinous* Exudation obtained from *Dorema Ammoniacum* (Nat. Ord. Umbelliferæ), a Persian plant.

Q.—What are the physical properties of Ammoniac?

If comes in tears, or lumps, of an irregular shape, tolerably hard and brittle, has an unpleasant bitter and acid taste, with a peculiar smell.

Q.—What does it contain?

A volatile oil (free from sulphur), a gum and a resin.

Q.—What is the dose of Ammoniac?

Gr. x–xxx.

Q.—What are the official preparations?

Two plasters are official (*Emplastrum Ammoniaci* and *Emplastrum ammoniaci cum hydrargyro*), also *Mistura Ammoniaci;* dose f℥ss–j.

Q.—What are its physical actions?

Its actions are similar to those of Asafœtida, but much less powerful. It is a stimulant, expectorant, a laxative and has a mild irritant action on the skin.

Q.—What is its Therapy?

Ammoniac is not much used. When at all, internally as an expectorant in chronic bronchitis and bronchorrhœa, and locally as a counter irritant. The plaster is a stimulating alterative and resolvent in glandular enlargements and indolent inflammatory swellings.

VALERIANA—Valerian.

Q.—What is Valerian?

The Rhizome and rootletts of *Valeriana officinalis* or *Wild* Valerian (Nat. Ord. Valerianacæ), a European plant.

Q.—What does it contain?

A volatile oil from which are developed by oxidation *Valerianic Acid, Valerene* and *Valerol.*

Q.—Is the Valerianic Acid of pharmacy derived from the plant?

No. It is a product of the oxidation of Amylic Alcohol (fusil oil), and from it are prepared the Valerianates.

Q.—What are the official preparations of Valerian?

Abstractum Valerianæ,	dose gr. x–ʒss
Oleum Valerianæ,	dose ♏ij–v
Tinctura Valerianæ,	dose ʒss–ʒij
Tinctura Valerianæ Ammoniata,	dose ʒss–ʒij

Q.—What are the physiological actions of Valerian?

It is generally classed as an antispasmodic, or nerve tonic. It is a powerful sedative to reflex excitability, diaphoretic, laxative and anthelmintic. In full doses it increases the action of the heart and raises the temperature. It reduces motility and sensibility, and decreases reflex excitability, being antagonistic to the action of Strychnine, Brucine, etc.

Q.—What is its Therapy?

Valerian is a valuable remedy in hysterical disorders of all kinds, in flatulence and nervous head-ache, in hypochondriasis, coughs, diabetes, convulsions and delirium.

Q.—What are its Dental uses?

The Valerianate of ammonia is used in dental and other neuralgias.

SERPENTARIA—Virginia Snake Root.

Q.—What is Serpentaria?

The root of *Aristolochia Serpentaria* and *Aristolochia recticulata* (Nat. Ord. Aristolochiaceæ), indigenous to the United States.

Q.—What does it contain?

A volatile oil, a Camphor-resin, and *Aristolochine*, a bitter principal, soluble in both alcohol and water.

Q.—What are the preparations of Serpentaria?

Extractum Serpentariæ Fluidum,	dose ♏x—xxx
Tinctura Serpentariæ, 10 per cent.,	dose fʒss—ij

Q.—What preparation of Cinchona contains Serpentaria?

The *Tinctura Cinchonæ Composita* has two parts of S. in 100—dose f℥j–ij.

Q.—What are the physiological effects of Serpentaria?

Small doses promote appetite and digestion, increases the bronchial and intestinal secretions, the action of the heart, the cutaneous circulation, and the surface temperature: and produces considerable mental exhilaration. Large doses are irritant, causing nausea and vomiting, vertigo and headache with colic, rectal tenesmus and frequent but not watery stools. Serpentaria is classed as a stimulant tonic and expectorant, a cardiac stimulant, diaphoretic, diuretic, emmenagogue, aphrodisiac and somewhat antiperiodic.

Q.—What is its Therapy?

Used chiefly as a vehicle for other stimulant drugs, but has many uses of its own. In bronchial affections, pneumonia of typhoid form, exanthemata, typhoid conditions generally, amenorrhœa, functional impotence, remittent fever, bilious vomiting, diphtheria, etc.

CANNABIS—Hemp.

Q.—What two varieties of Cannabis are official?

Cannabis Indica, or Indian Hemp and *Cannabis Americana*, or American Hemp.

Q.—What is Cannabis?

The flowering tops of *Cannabis Sativa* (Nat. Ord. Urticaceæ). Of the American variety the whole plant is used, collected while flowering.

Q.—How does the American compare with the Indian variety?

Its effects are similar but less powerful.

Q.—What does Cannabis contain?

A resin, named *Cannabin*, and a volatile oil.

Q.—What are the preparations of Cannabis?

Extractum Cannabis Indicæ,	dose	gr.1-6–j
Extractum Cannabis Indicæ Fluidum,	dose	♏j–v
Tinctura Cannabis Indicæ (20 per cent.),	dose	♏xx–℥j
Cannabini Tannas (Unofficial),	dose	gr. v–x

Name some preparations used in the East and containing this resin.

Churrus Gunjah, and Hashish.

Q.—What are the physiological actions of Cannabis?

In full medicinal doses it at first stimulates and then depresses the cerebro-spinal functions without affecting respiration or circulation to any marked extent. It is classed as antispasmodic, analgesic, anæsthetic and narcotic, a cerebro-spinal stimulant, and aphrodisiac. The after effects are dullness, vertigo, headache and confused thought, but no nausea, vital depression or constipation.

Q.—What is its Therapy?

Migraine, neuralgia, uterine affections, traumatic tetanus, delirium tremens, dysuria, impotence, gonorrhœa and insomnia.

Q.—What use has been made of Cannabis in dental practice?

It has been used as an ingredient for a local anæsthetic in extraction.

Give a prescription containing Cannabis for this purpose.

℞	Ætheris Fortiori (Squibb's)	℥jss
	Pip. Mentholis Crys. (Todd's)	ʒj
	Fl. Ex. Cannabis Indicæ,	gttxx
	Olei Menthæ Piperitæ,	♏xv

M. et Sig: Saturate absorbent cotton with a small quantity (about 60 drops) of the compound, and apply to the gums, allowing it to remain five minutes before operating. (Dr. BOWNE.)

Q.—Are there any precautions necessary in using this compound?

Yes, it is best to use only the required quantity, and to direct the patient not to swallow the saliva while the application is on the gums, as the maximum dose of the Cannabis Indica is five drops.

ERYTHOXYLON—Coca.

Q.—What is Erythroxylon?

The leaves of *E. Coca* (Nat. Ord. Erythroxylaceæ), a shrub of Peru.

Q.—What do these leaves contain?

An alkaloid called *Cocaine*, and a peculiar tannin known as Coca-tannic Acid.

Q.—What are the preparations of Erythroxylon and its alkaloid?

Only the fluid extract is official.

Extractum Erythroxyli Fluidum,	dose fʒss–ij
Cocaini Hydrochloratis (unofficial)	dose gr. ⅓–j

Other salts of Cocaine, Hydrobromate and Citrate, have been made and experimented with, also Oleates, five to twenty per cent., made with the alkaloid itself and Oleic Acid. Wines, Glyceroles, Pastes, Lozenges, etc., of Coca, are sold in great variety.

Q.—How are the salts of Cocaine usually administered?

In Aqueous solution, locally, or hypodermatically, for their anæsthetic effect.

Q.—What are the physiological effects of Cocaine?

In small doses Cocaine is a cerebral, cardiac, respiratory and nervous stimulant. It dilates the pupil, both when locally applied and when taken systemically. An overdose produces symptoms of cardiac and respiratory embarrassment in a very short time. The pulse, at first quick and forcible, becomes small, rapid and intermitting; the heart apparently standing still in systole once in every ten or twelve beats. Respiration is slow and shallow, and a sense of "tightness" about the chest is very marked; the skin grows cold and clammy, and the subject is seized with a sense of impending dissolution.

Q.—How does death occur from Cocaine?

In animals by paralysis of respiration, but in man there seems to be a tetanoid spasm of the cardiac muscle, which is equally dangerous to life. Other symptoms are impairment of co-ordination, hallucinations and delirium. Lethal doses paralyze the intra-cardiac motor ganglia, the posterior columns of the cord and the sensory nerves, and the respiratory centre.

Q.—When locally applied, what is its effect?

Anæsthetic, its power being very great over a limited area.

Q.—How is the local anæsthesia produced?

It is thought by some to be due to its paralyzing the terminal twigs of the sensory nerves, by others to vaso-motor action rendering the nerves bloodless, and therefore unable to transmit sensory impressions. It produces mydriasis by stimulation of the ends of the sympathetic in the iris, and does not effect the third nerve or the sympathetic centre.

Q.—What is the therapy of Coca and its Alkaloid?

Used in wasting diseases as a stimulant to digestion and to retard waste, in convalescence, in migraine, and neuralgia, in vomiting of pregnancy, in stomatitis, as a local anæsthetic, in rhus poisoning, and as a mydriatic.

Q.—What are the Dental uses of the Alkaloid and its salts?

Owing to its anæsthetic properties, Cocaine has proven valuable in operations in the mouth affecting the mucous membrane and the immediately subjacent tissues. With variable results it has also been used in the extraction of teeth. In the surgical treatment of pyorrhœa alveolaris, and in the extirpation of the pulps of teeth it has proven efficient, and in some cases of hypersensitive dentine. Cocaine has also been employed in combination with arsenious acid for a devitalizing mixture.

Q.—How is Cocaine usually applied in extraction?

In aqueous solution, hypodermatically, a two to four per cent. average.

Give a few prescriptions containing Cocaine.

To make a four per cent. solution of Hydrochlorate of Cocaine.

℞	Cocaini Hydrochloratis (Crys),	gr. 2¼
	Aquæ Distillatæ,	f℥j
M.	et ft. sol.	

For exposed pulps.

℞	Cocaini Hydrochloratis (Crys),	gr. vj
	Spiritus Menthæ Pip.,	f℥j
M.	Signa: Apply on a pledget of cotton	

For local Anæsthesia.

℞	Cocaini Hydrochloratis,	grs. viij
	Chloralis Hydrat,	gr. v
	Acidi Carbolici,	gttiij
	Aquæ destil.	f℥iij

M. Signa: Inject two or three drops into the gum.

(J. M. LEWIS.)

To make Oleate of Cocaine.

℞	Cocaini (alkaloid),	gr. ijss
	Acidi Oleic (pure),	♏xx
	Olei Amygdalæ,	♏xl

Dissolve the Alkaloid in the oleic acid and add the almond oil.

For Neuralgia and Odontalgia.

℞	Cocaini Hydrochloratis (Crys.),	gr. xv
	Olei Caryophylli,	f℥j

Signa: Apply as a lotion, or on a pledget of cotton.

(The above from GORGAS.)

Nerve Paste

℞	Acidi Arseniosi,	
	Cocaini Hydrochloratis,	āā gr. xx
	Mentholis (Crys.)	gr. v
	Glycerini q. s. to make paste.	

Another.

℞	Acidi Arseniosi,	1 part
	Cocaini Hydrochlor,	4 parts
	Lanolini,	5 parts

Q.—What are the physiological antagonists of Cocaine?

Amyl Nitrite combats the earliest symptoms of cardiac depression, then alcohol and opium as stimulants to the heart, also artificial respiration. The most direct antagonist is chloral, so also are chloroform and ether; morphine is directly antagonistic at almost all points.

CAFFEINE—Theine.

Q.—What is Caffeine?

The active principle of the seed of *Coffea Arabica*, or the Coffee plant, a small tree of the Nat. Ord. Rubiaceæ. It is also prepared from the dried leaves of *Camellia Thea*, and from *Guarana*.

Q.—What is Theine?

The active principle contained in the leaves of

Camella Thea, the Tea plant (Nat. Ord. Ternstromiaceæ), a native of China and Japan.

Q.—What are the preparations of these substances?

Caffeina, Caffeine,	dose gr. j–v
Guarana, Guarana	dose ʒj–ij in powder
Extractum Guaranæ Fluidum (Unofficial.)	dose ʒj–ij
Caffeinæ Citras,	dose gr. ij–x
Theina, Theine,	dose gr. 1–6–j

Q.—What are the physiological effects of these substances?

Coffee is a cerebro-spinal stimulant, a stomachic tonic, a laxative, diuretic, antiperiodic, and antiseptic. Caffeine in general terms is a stimulant at first, and subsequently a paralyzant, to the nerve centres in the cerebrum, medulla and cord. Theine agrees in most respects with Caffeine, except that it requires larger doses to produce the same effects. It differs, however, in some important particulars. Theine chiefly affects the sensory, Caffeine the motor system. Theine decreases the body temperature, Caffeine increases it.

Q.—What is the Therapy of these agents?

Caffeine is a valuable stimulant in many forms of nervous and cardiac depressions, in headaches of neuralgic or nervous type, insomnia of chronic alcoholism, asthma and opium narcosis. Theine is a valuable analgesic by reason of its prolonged influence over sensation, in neuralgia, locomotor ataxia, lumbago, etc.

Q.—How are the effects of the common stimulant beverages compared?

The qualities possessed in common by these substances are three-fold. They all (1) retard the retrograde metamorphosis of the body-tissues (tissue waste), (2) when used in moderation stimulate the mental processes, and (3) act as sedatives to the nervous system. Coffee is more stimulating than Coca, and less sustaining. Tea is the most refreshing and stimulating of the group. Coca is more sustaining and less of a direct stimulant than either tea or coffee. Cocoa (the chocalate tree) is more directly nutritious than any of the group, as it contains a large quantity of fat (oleum theobroma or cacao-butter).

Q.—Are these agents of any special use to the Dentist?

Freshly roasted and finely pulverized Coffee is used as a deodorant and as an antiseptic. It is especially efficient in disguising the odor of such drugs as iodoform, creasote, etc., and a small quantity kept in the medicine case will go far towards ridding the office of medicinal odors. In the treatment of neuralgias of nervous origin, these agents will also be found useful.

CEREBRAL DEPRESSANTS.

Q.—What remedies are classed as Cerebral Depressants?

Alcohol	—and—	Aldehydes.
Ether		Chloroform.
Carbon Bisulphide		Chloral.
Croton Chloral		Opium.
Hops		Lettuce.
Bromine	—and—	Bromides.

ALCOHOLS AND ALDEHYDES.

Q.—What is an Alcohol?

An Alcohol is a volatile organic compound of an organic radical and Hydroxyl (HO), contains no N, has a great affinity for water, and reacts with acids to form H_2O and Ethers.

Q.—How is Alcohol obtained?

By distillation from the fermented product of grape-sugar, or some substance (as starch) easily converted into grape-sugar. It may also be made synthetically by shaking olefiant gas with strong sulphuric acid, then diluting and distilling.

Q.—What are the three most important Alcohols?

Methylic, Ethylic, and Amylic.

Q.—What is Methylic Alcohol?

Wood Spirit, CH_4O.

Q.—What is Ethylic Alcohol.

Grain Spirit, C_2H_6O.

Q.—What is Amylic Alcohol?

Potato-spirit, Fusil Oil, $C_5H_{12}O$.

Name another important Alcohol.

Phenylic Alcohol, Phenol, Carbolic Acid C_6H_6O, and is obtained from Coal-tar.

Q.—What is an Aldehyde?

An Alcohol from which has been removed two atoms of hydrogen, hence its name *Al*(cohol)*dehyd* (rogenatum).

Q.—What are the principal Aldehydes?

Acetic Aldehyde and Paraldehyde.

Q.—What is a Ketone?

An Aldehyde in which the H has been replaced by a radical. Hypone the most important.

Q.—What are the official preparations of Alcohol?

ALCOHOL; contains 94 per cent. by volume, 91 per cent. by weight, of Ethylic Alcohol, sp. gr. 0.820 at 60° F.

ALCOHOL DILUTUM (Diluted Alcohol); contains 50 per cent. Alcohol, sp. gr. 0.920.

SPIRITUS FRUMENTI (Whisky); an alcoholic liquid obtained by distillation from grain, and at least two years old; it contains 50 to 58 per cent. by volume of Alcohol, sp. gr. 0.917 to 0.930.

SPIRITUS VINI GALLICI (Brandy); an Alcoholic liquid obtained by distillation of fermented grapes, and at least four years old; it contains from 46 to 55 per cent. by volume of Alcohol, sp. gr. 0.925 to 0.941.

SPIRITUS ODORATUS (Cologne Water); contains 80 per cent. Alcohol.

VINUM ALBUM (White Wine); the fermented juice of the grape, containing 10 to 12 per cent. by weight of absolute Alcohol.

VINUM ALBUM FORTIUS (Stronger White Wine); contains 20 to 25 per cent. by weight of absolute Alcohol.

VINUM RUBRUM (Red Wine); the fermented juice of colored grapes in the presence of their skins, and contains 10 to 12 per cent. of absolute Alcohol. It is somewhat astringent.

Q.—What are the unofficial preparations of Alcohol?

ABSOLUTE ALCOHOL, sp. gr. 0.794. That of the shops is rarely stronger than 98 per cent.

RECTIFIED SPIRIT, sp. gr. 0.835; contains 85 per cent. by weight of absolute Alcohol and no fusel oil.

PROOF SPIRIT, sp. gr. 0.920; contains 48 per cent. of Alcohol.

RUM, obtained from the distillation of fermented molasses, contains about 42 per cent. by weight of Alcohol.

GIN has about the same Alcoholic strength as rum; is distilled from rye or barley, and flavored in Holland with juniper berries and hops.

VINUM PORTENSE (Port Wine), has 30 to 40 per cent. Alcohol.

VINUM XERICUM (Sherry), has about 20 to 35 per cent. Alcohol.

SPARKLING WINES, Champagne, Catawba, etc., are sweet, and charged with Carbonic acid, being bottled before fermentation has ceased.

SWEET WINES, Burgundy, Tokay, Muscatel, Malaga, Angelica, Madeira, etc., are of low Alcoholic strength, 6 to 7 per cent., unless fortified.

LIGHT RED WINES, Claret, Red Rhine, Concord, Port, 5 to 6 per cent.

BEER, by slow fermentation, yeast failing; Alcohol 2 to 3 per cent.

ALE, by rapid fermentation, yeast floating; Alcohol 2 to 6 per cent.

PORTER, Stout, much coloring matter; Alcohol 4 to 6 per cent.

KOUMYSS is obtained by the fermentation of milk, and contains from 1 to 3 per cent. Alcohol.

Q.—What are the physiological actions of Alcohol?

It is a cerebral excitant and depressant, and a narcotic poison. It is anæsthetic and anti-parasitic, a mild counter-irritant, and coagulates albumen by abstracting its water. It is very diffusible, partly oxidised by the organism, partly excreted. In small doses it relaxes the vessels, stimulates the gastric glands, promotes appetite and digestion, lessens the elimination of waste products (Urea and CO_2), causes a subjective sensation of heat, and slightly raises the body temperature. It briefly stimulates the heart, prolonging its systole and reducing the length of the diastole, and increases the functional activity of all the organs.

The continued use of small or moderate doses congests the stomach and liver, over stimulates the gastric glands and the hepatic cells to the production of pathological secretions, causes gastric catarrh and morning vomiting of mucus, and impairs digestion.

In large doses alcohol precipitates pepsin and destroys its activity as a ferment, arrests digestion, produces exhilaration, intoxication, hallucinations, delirium, muscular inco-ordination, depression of the heart, lowered arterial tension and body temperature, abolished reflexes and coma. A Toxic Dose, after a brief period of excitement, produces insensibility, stertorous breathing, dilated or contracted pupils, complete muscular resolution, and death by paralysis of the heart and respiration.

Q.—How should acute alcohol narcosis be treated?

The contents of the stomach should be evacuated ammonia or strychnine should be given, and the hot and cold douche alternately used, faradism of the muscles of respiration.

Q.—What are the therapeutic uses of Alcohol?

Though decidedly injurious in health, in disease Alcohol is a most valuable agent. In some cases of nausea, in sea-sickness, in atonic indigestion, phthisis, cholera infantum, diarrhea, etc., cardiac failure, chloroform anæsthesia, poisoning by cardiac depressants and snake-venom, diphtheria, adynamic fevers, gonorrhœa, insomnia from cerebral anæmia, delirium tremens, wounds, bed sores, colds, etc. To improve digestion and nutrition, it is useful in many chronic diseases but the danger of forming the Alcohol habit should never be lost sight of. Locally it is used as an antiseptic and stimulant dressing for wounds, to harden cuticle when bed sores are imminent and as a tonic cooling lotion.

Q.—Is Alcohol to any extent a food?

So considered, within narrow limits; f℥iss per diem being about the average amount an adult can oxidize.

Q.—What are the Dental uses of Alcohol?

In the laboratory Alcohol is used for heating and cleaning purposes, also as a solvent for some of the gum resins, from which varnishes are prepared. In the office as a narcotic to relieve pain. In combination with tannic acid or chloride zinc, to obtund sensitive dentine, as a styptic, combined with equal parts of water as a lotion in superficial inflammations, for cleaning and drying pulp canals, and as a gargle in mercurial stomatitis.

ÆTHER—Ether.

Q.—What is Ether?

This substance, improperly called "Sulphuric Ether" is *Ethylic Ether*, or the *Oxide of Ethyl.*

Q.—From what is it derived?

From Ethylic Alcohol, prepared by its distillation with Sulphuric Acid, the latter body dehydrating the Alcohol and remaining in the retort.

Q.—What are the physical properties of Ether?

Ether is a volatile, colorless, inflammable liquid, lighter than water; its vapor being heavier than air, and forming therewith a highly explosive mixture. It is a solvent for oils, fats, resins, caoutchouc, gutta percha, and many other substances.

Q—What are the official preparations of Ether?

ÆTHER sp. gr. 0.750. Contains about 26 per cent. by weight of alcohol and a little water.

ÆTHER FORTIOR, Stronger Ether, sp. gr. 0.725, Ethyl Oxide, $C_4H_{10}O$. Wrongly called "Sulphuric Ether." Contains about six per cent. of alcohol and a little water.

ÆTHER ACETICUS, Acetic Ether, sp. gr. 0.890, Acetate of Ethyl, $C_4H_8O_2$. Used in making the Spiritus Odoratus, and the Tinctura Ferri Acetatis.

Name some of the chemical analogues of Ether.

SULPHURIC ETHER, properly so called, Ethyl Sulphate, $C_4H_{10}SO_4$.

NITROUS ETHER, Ethyl Nitrite, $C_2H_5NO_2$. A solution of this in alcohol is the well-known diuretic and diaphoretic, sweet spirits of nitre. Dose ♏v–ʒij.

SPIRITUS ÆTHERIS, Spirit of Ether ♏v–ʒj. Ether 30 parts, Alcohol 70 parts.

SPIRITUS ÆTHERIS COMPOSITUS, Compound Spirit of Ether (Hoffman's Anodyne) contains Alcohol 67, Ether 30, Ethereal Oil 3. Dose ♏v–ʒj.

HYDROBROMIC ETHER, Ethyl Bromide (Unofficial), is not inflammable. Dose ♏x–ʒj.

HYDRIODIC ETHER, Ethyl Iodide (Unofficial), is a colorless non-inflammable, and insoluble in water. Dose, inhaled, ♏xv.

Anæsthetis mixtures:

Ether 3, Chloroform 1, Alcohol 1.
Ether 9, Chloroform 30, Alcohol 9.
Ether 3, Chloroform 1.
Ether 3, Chloroform 2. Alcohol 1.

What are the physiological actions of Ether?

Ether is anodyne, antispasmodic, diaphoretic, and anthelmintic, a cardiac and cerebral stimulant, an anæsthetic, and a narcotic poison. Administered internally it is one of the most powerful secretion-stimulants known, acting especially on the secretions of the stomach, salivary glands and pancreas. On the cerebrum and the motor and sensory nerves its action is similar to that of alcohol, but more prompt and less protracted. It is eliminated quickly, chiefly by the lungs.

Q.—What are the actions of Ether when inhaled?

At first it produces faucial irritation, a sense of strangulation and cough, then a stage of excitement (cerebral intoxication), in which the face is flushed and the respiration and pulse are quickened. A tetanic convulsive stage generally follows, the face being cyanosed, the muscles rigid, the respiration stertorous. This soon subsides, and complete insensibility is established, the muscles being relaxed and the reflexes abolished. The cerebral functions are suspended, the lower centres in the medulla continuing to carry on the processes of respiration and circulation. If the inhalation be continued these too become paralyzed, death usually resulting from slow paralysis of respiration, the heart pulsating long after breathing has ceased (Chloroform usually paralyzing the heart. (?) If the inhalation be discontinued before the lower centres are affected, the patient gradually emerges from the condition of insensibility and as the narcosis subsides, vomiting is usually experienced.

Q.—How does the action of Ether compare with that of Chloroform?

Ether is less irritant to the mucous membrane when swallowed, but its vapor is more irritant to the air passages. It is more of a general stimulant, and less depressant to the heart and circulation. It does not clot the blood. Its vapor is very inflammable, less pleasant to inhale, slower in action, has a longer stage of excitement, a less profound narcosis, and causes a greater degree of vomiting. It is much less dangerous than chloroform, death from the inhalation of Ether occuring slowly and usually from paralysis of respiration; from Chloroform it is almost always sudden and by paralysis of the heart. The reported cases of fatal Chloroform narcosis number about five hundred, those from Ether something over twenty.

Q.—What are the Contraindications for Anæsthesia?

Fatty degeneration or dilatation of the heart, renal and pulmonary disease, enlarged tonsils, cerebral tumor, and chronic alcoholism, particularly the first and the last named.

Q.—How should dangerous symptoms, during Anæsthesia, be met?

First withdraw the vapor and invert the patient, head downwards, draw the tongue forwards, and apply a cold douche to the face and chest. *Atropine* hypodermatically is an agent of great value in combating the cardiac failure. Artificial respiration and faradization of the respiratory muscles if breathing ceases. *Amyl nitrite* by inhalation, or ammonia hypodermatically: Heat to the body and limbs.

Q.—What are the Therapeutic uses of Ether?

When diluted with Alcohol, Ether mixes readily with water, and may be administered internally in indigestion of fats, gastralgia, colic, flatulence, syncope, hysteria, cholera, neuralgia, etc. As a local and genera anæsthetic.

Q.—What are its Dental uses ?

In dental practice Ether is employed both as a general and local anæsthetic, as an ingredient of obtundent applications, as a dressing to root canals, to dissolve the oils and fats, as a solvent for many medicaments, as a topical anodyne in neuralgia and odontalgia (combined with other agents), in apthæ and stomatitis, and as a counter irritant, evaporation being prevented.

Give a few prescriptions containing Ether.

For Odontalgia.

℞	Æther Sulph.	℥ss
	Creasoti	gtt. xv
	Fl. Ex. Gallæ	ʒss
	Pulv. Camph.	grs. xv
M.	Signa: To be applied on a little cotton.	

As a local Anæsthetic.

℞	Æther Sulph.	℥j
	Camph. Pulv.	℥ss
M.	Ft. sol.	
	Signa: Apply to parts.	

As a dressing to pulp canals.

℞	Æther Sulph	℥j
	Iodoformi qs. ad. saturandum.	
	Signa: Pump into the canal.	

For painless extirpation of exposed pulp.

℞	Cocaini Hydrochloratis	gr. x
	Ætheris Sulph	♏xc
M.	Signa: Apply for four or five minutes.	

(HARLAN.)

CHLOROFORMUM—Chloroform.

Q.—What is Chloroform?

Chloroform is the result of the distillation of Alcohol with Chlorinated lime. The *Ter-chloride of Methyl.*

Q.—What is its chemical formula and sp. gr.?

$CHCL_3$ sp. gr. 1.480—1.490.

Q.—Is Chloroform produced in any other way?

Yes. It may be made from Chloral by an alkaline hydrate, and is known as *Normal Chloroform.*

Q.—When prepared from Methylic Alcohol how is it known?

As *Methylic Chloroform*, and is purified with great difficulty.

Q.—What is the object of purifying Chloroform?

It is to remove the chlorinated pyrogenous oil.

Q.—What are the official preparations of Chloroform?

CHLOROFORMUM VENALE, Commercial Chloroform, contains at least 98 per cent. of Chloroform and a sp. gr. not lower than 1.470. For local use—contains hydro-carbons, free Chlorine, acids, etc. Chloroformum Purificatum, Purified Chloroform, sp. gr. not lower than 1.485. Dose ♏j–ʒss diluted, internally; ʒj–℥j by inhalation.

SPIRITUS CHLOROFORMI, Spirit of Chloroform, Chloroform 10 parts, Alcohol 90 parts. Dose ♏v–ʒij, well diluted.

MISTURA CHLOROFORMI, Chloroform Mixture. (Chloroform 8, Camphor 2, Albumen 10, Water 80 parts.) Dose, ʒj–℥j.

LINIMENTUM CHLOROFORMI, Chloroform Liniment, (Chloroform Venale 40, Linimentum Saponis 60 parts). Anodyne for local use.

The following are unofficial: *Linimentum Chloroformi Compositum, Tinctura Chloroformi et Morphinæ Tinctura Chloroformi Compositus, Chlorodyne.*

Q—What percentage of Chloroform should be mixed with the air inhaled?

Not more than three and a half per cent. (?)

Q.—What are the physiological actions of Chloroform?

The action of Chloroform is similar to that of Ether, with several important differences. It is more irritant to mucous membranes, and if swallowed undiluted, produces violent gastro-enteritis, and profound narcosis, if in quantity. It is less of a stimulant than Ether and more depressant to the heart and circulation. It clots blood outside of the body. Locally it is somewhat anæsthetic and if evaporation be prevented, is irritant and even a painful vesicant. It assists the absorption of organic alkaloids by the skin, which otherwise would not penetrate the epidermis. When inhaled anæsthesia, and unconsciousness rapidly result. When swallowed in small doses it stimulates the secretions and increases peristalsis.

Q.—How does the action of Chloroform compare with that of Ether?

Ether is the safer anæsthetic; chloroform the more rapid, more transient in its effects, which are produced by smaller amounts, pleasanter, less irritating, and with less disagreeable after-effects. It does not cause so much vomiting, and its vapor is not inflammable.

Q.—What are the therapeutical uses of Chloroform?

It is used for the same conditions as is Ether, and is much employed locally in liniments as a rubifacient and anodyne, as in rheumatic and neuralgic pains of chronic character. Used in cholera, respiratory neurosis, sciatica, tic-douloureux, and as a general and local anæsthetic.

Q.—What are the Dental uses of Chloroform?

A general and local anæsthetic, for which latter purpose it is usually combined with other agents. As an anodyne and anti-spasmodic, either locally applied or the vapor inhaled, as in the treatment of convulsions of dentition, for which it is a very efficient remedy. As a solvent for many medicaments, gums, resins, etc., and also as a hæmostatic.

Q.—What precautionary methods are advised previous to the inhalation of Chloroform.

In order to sustain the heart and respiration, and to make the anæsthesia more profound, an ounce of brandy should be administered, and morphine gr. $\frac{1}{6}$ and atropine gr. $\frac{1}{120}$ subcutaneously injected.

Give some prescriptions containing Chloroform?

For Acute Pericementitis.

℞	Chloroformi,	ʒij
	Tinct. Aconit. Rad.,	
	Tinct. Belladonnæ,	āā ʒiij

M. Signa: Rub on gums.

For Ear Ache of Dentition.

℞	Chloroformi,	ʒj
	Oleum Olivæ,	℥j

M. Signa: Pour from gtt. x to xx in ear and close orifice with cotton. (GORGAS.)

For a Local Anæsthetic.

℞	Chloroformi purificati,	
	Tincturæ Aconiti,	
	Alcoholis,	āā f℥j
	Morphinæ Sulph.,	gr. vj

M. Signa: To be applied to gum over root of tooth to be extracted. (GORGAS.)

NITROGEN MONOXIDE—N_2O.

Q.—What are the synonyms for Nitrogen Monoxide?

Hyponitrous Oxide, Nitrous Oxide, Nitrogen Protoxide, Laughing Gas.

Q.—When was it first discovered?

By Priestly in 1776.

Q.—When was it first used in dentistry?

By Dr. Horace Wells, of Hartford, in 1844.

Q.—When was it introduced as an anæsthetic?

In 1863.

Q.—What is its theoretical constitution?

N_2O—Two atoms of nitrogen with one of oxygen; by volume, 2 parts of nitrogen to 1 of oxygen; by weight, 28 parts of nitrogen to 16 of oxygen, Molecular weight, 44. Density, 22. Sp. gr. 1.527. Weight of a litre, 1.08 gramme. (MITCHELL.)

Q.—What are its physical properties?

A colorless, ordorless gas, having a sweetish taste; soluble in water, more so in alcohol. Supports combustion, the heat of burning bodies decomposing it and setting oxygen free. Condenses to a colorless liquid under pressure of 50 atmospheres and temperature of 45°F., sp. gr. of the liquid, 0.908. Boiling point −126°F., fuzing point −150°F.

Q.—How is it prepared?

By cautiously heating ammonium nitrate, which is decomposed, yielding laughing gas and water.

$$NH_4NO_3 = N_2O \times 2H_2O.$$

Ammonium Nitrate. Nitrous Oxide. Water.

(Mitchell.)

Q.—What precautions should be observed in its preparation?

The ammonium nitrate should be perfectly free from chlorides; excessive heat should not be applied (482°F. the limit), and the gas formed should be passed through wash-bottles containing sodium hydrate and ferrous sulphate.

Q.—How much gas will one pound of nitrate of ammonia produce?

About thirty gallons.

Q.—What are the physiological actions of Nitrous Oxide?

When inhaled, in from one to three minutes complete anæsthesia occurs with loss of consciousness, often preceded by a stage of excitement. The face becomes livid, and the patient presents the appearance of asphyxia. The anæsthesia is probably due to diminution in the relative amount of oxygen in the blood. When the inhalation is discontinued, consciousness and sensation speedily return, and, as a rule, no after-effects are manifested.

Q.—In what order are the nerve centres paralyzed?

(According to Underwood of London:)

"1st. The cerebrum, destroying volition so that action is no longer designed or controlled by the intelligence of the individual.

"2d. The sensory centres of the cord, after which movement is erratic and not even responsive to the sensory stimulus.

"3d. The motor centres of the cord, after which movement ceases; and lastly the sensory and motor centres of the medulla, after which respiration, the heart's action, and all the functions of life cease."

Q.—How much gas is usually required to produce complete anæsthesia?

From five to fifteen gallons; much larger amounts, however, have been given.

Q.—What are the therapeutical uses of Nitrous Oxide?

As a general anæsthetic in minor surgical operations of short duration. It has also been administered for the relief of neuralgias, nervous aphonia, local paralysis, asthma, and diseases of the lungs and kidneys.

Q.—What are the Dental uses of Nitrous Oxide?

Principally as a general anæsthetic for the extraction of teeth or minor operations, such as lancing abscesses, devitalizing pulps, etc., and in the laboratory in certain patented blow-pipes.

Q.—How is it usually administered?

From an iron cylinder containing 100 gallons or more of the condensed or liquified gas, to which is attached a rubber bag and inhaling tube with a double valve and mouth-piece.

The same general precautions are necessary with this agent as with other general anæsthetics, and the same methods of resuscitation will apply.

CARBONEI BISULPHIDUM—Bisulphide of Carbon.

Q.—What is Bisulphide of Carbon?

(CS_2) A clear, colorless, diffusive, neutral liquid, highly inflammable, obtained from heated charcoal in the presence of sulphur. Dose ♏ss–j.

Q.—What is the physiological action of Carbon Bisulphide?

Its vapor produces headache, vertigo, emaciation, inco-ordination of movements and a depression of the general senses, with impaired sensation and motility, a general anæsthetic and a powerful paralyzant.

Q.—What is its Therapy?

It may be used in irritable ulcers as a counter irritant. In gastralgia and in nausea and vomiting. Its horrible odor precludes its use for any purpose for which another remedy can be found.

Q.—For what is it used in Dentistry?

To dissolve Caoutchouc.

CHLORAL, CROTON-CHLORAL, etc.

Q.—What is Chloral?

Anhydrous Chloral is an oily liquid made by saturating absolute alcohol with dry chlorine gas, and is *trichloraldehyde* $C_2H\,Cl_3O$. By uniting with water, a hydrate is formed, which occurs in a crystalline form. C_2HCl_3O,H_2O.

Q.—What are the physical properties of chloral?

A white crystalline solid, soluble in alcohol, water, and glycerin, decomposed by alkalies into chloroform and a formiate of the alkaline base. It liquifies when mixed with camphor or carbolic acid. Its aqueous solution becomes acid, but the alcoholic solution remains neutral.

Q.—What is the dose of Chloral?

The dose varies much with individual susceptibility and with the presence or absence of cardiac and pulmonary disease. Tolerance is established by habitual use. An average dose for a healthy adult is gr. xv; for a child gr. j for each year of age up to gr. vi. It is best administered in syrup of tolu.

Q.—What are the principal analogues of Chloral?

Amylene Hydrate,	dose ʒj–iss
Cannabini Tannas	gr. ij–x
Croton Chloral (Butyl Chloral Hydrate),	gr. v–xx
Hyoscinæ Hydrobromas,	gr. 1-60
Hypnone	♏v–x, in Cap.
Chloralamid,	gr. xx–xl
Menthylal,	♏iv–v
Paraldehyde,	ʒss–j
Sulphonal,	gr. xv–xlv
Urethane,	gr. xv–ʒj

Q.—What are the Physiological effects of Chloral?

Chloral is essentially a hypnotic, also a depressant of the cerebro-spinal centres, antispasmodic, antiseptic, antiferment, counter-irritant, and prevents the coagulation of fibrin. In medicinal doses it causes quiet natural sleep, contraction of the pupil and deep regular breathing. After *larger* doses the sleep is deeper and may even pass into coma, respiration is slowed, the cardiac action is weakened and diminished, the temperature falls, and sensibility and reflex action are depressed. It is not an anodyne when internally administered. The *continued* use of chloral causes *Chloralism*, or the chloral habit, and produces an anæmic condition, with weak, irregular heart, irritable temper and loss of self control.

Q.—What are the symptoms of Chloral poisoning?

Profound narcosis, great muscular relaxation, slow and very weak pulse, diminished frequency of breathing, marked contraction of the pupil, and lividity of the surface, with great reduction of body heat.

Q.—What is the treatment for Chloral poisoning?

Maintain the temperature by artificial heat, maintain the cardiac action by *Atropine*, in small doses, repeated as required, and maintain the respiration (partly by the atropine, or by morphine, and partly by artificial manipulation).

While Chloral is the best antidote for Strychnine poisoning, the converse does not hold good.

Q.—What is the action of Chloral on the blood?

It diffuses rapidly into the blood, which, being an alkaline fluid, partially decomposes it, setting Chloroform free (?) It crenates the red corpuscles, and in large quantities destroys the leucocytes. It increases the fluidity of the blood, producing an anæmic condition.

Q.—How is Chloral eliminated?

Partly by the kidneys and partly by the skin, causing various eruptions if long used.

Q.—What are the therapeutic uses of Chloral?

As a *hypnotic* Chloral is employed in *insomnia*, hysterical or maniacal excitement, and in delirium tremens and mania-a-potu, but is contra-indicated in any condition where the heart is weak or has undergone fatty degeneration. As a motor-depressant in uræmic, infantile, or puerperal convulsions, in tetanus, and in poisoning by strychnine, it is of great service, and has been used in whooping cough and chorea. Locally, in diluted solution, it has been used as an anodyne and antiseptic dressing; triturated with equal parts of camphor, it forms a valuable liniment in neuralgia and muscular pains.

Q.—What is Croton Chloral?

Also called Butyl-Chloral Hydrate, is made by the action of Chlorine gas on Acetic Aldehyde, and occurs in small glittering crystals.

Q.—How does it compare with Chloral?

Its effects and uses are similar, but as it seems to possess a decided anæsthetic effect over the filaments of the trigemini, it is much used in neuralgiæ, affecting the branches of these nerves.

Q.—What are the Dental uses of Chloral, etc.?

Locally for relief of odontalgia, etc., gr. ss–j, applied to inflamed pulps, is an efficient remedy. It is also used for the relief of neuralgia of the fifth pair of nerves, also as a stimulant and deodorizing application to foul and fetid indolent ulcers, as a local anæsthetic, combined with camphor and other agents, for the relief of pain in pericementitis, as an injection for alveolar abscess, and diluted with water, as a lotion for inflammations of the oral mucous surface. It has been employed hypodermatically, but painful phlegmons have resulted from its repeated application. It has been combined with solutions of cocaine, but with doubtful benefit.

Give a few prescriptions containing Chloral.

For Indolent Ulcers.

℞	Chloral Hydratis,	gr. x
	Aq. Destillatæ,	f℥j

M. Signa: To be applied as a lotion. (GORGAS.)

As a Local Anæsthetic.

℞	Chloral Hydratis	
	Pulv. Camphoræ,	āā ℥j

M. Signa: To be applied as an obtunding mixture, by means of an applicator. (GORGAS.)

As a Hypnotic.

℞	Chloral Hydratis,	ʒij
	Syr. Aurant. flor.,	
	Syr. Tolu	āā ʒiv
	Aq. dest.,	℥vj

M. Signa: Dose 1-6 part. largely diluted. (GORGAS.)

For Neuralgia and Exposed Pulps.

℞	Chloral Hydratis,	2 parts
	Camphoræ,	5 parts
	Cocaini Hydrochlor.,	1 part

M. Heat to about boiling point of water till liquified.
Signa: Apply locally. (GORGAS.)

For Neuralgia of Trigemini.

℞	Butyl Chloral Hydratis,	gr. xxx
	Alcoholis,	
	Glycerini,	āā fʒij
	Aquæ dest.,	f℥j
	Syr. Glycyrrhizæ qs. ad.,	℥iij

M. Signa: Tablespoonful (a dose) every half hour.

OPIUM—Opium.

Q.—What is Opium?

Opium is the *concrete, milky exudation* of the unripe capsules of *Papaver Somniferum*, white poppy (Nat. Ord. Papaveraceæ), a native of Persia, but cultivated throughout the civilized world.

Q.—What does Opium contain?

Opium contains seventeen alkaloids, two neutral substances and two organic acids, together with sugar, gum, resin, pectin, extractives, odorous principles, water, etc.

Q.—What are the most important alkaloids of Opium?

Morphine, Codeine, Thebaine, Narceine, Papaverine, Narcotine.

Name the other alkaloids found in Opium.

Cryptopine, Pseudo-morphine, Protopine, Cotomine, Laudanine, Codamine, Rhœadine, Meconidine, Laudanosine, Lanthopine and Gnoscopine.

Q—What acids are found in Opium?

Meconic acid, 4 per cent. and Lactic acid 1¼ per cent.

Q.—What neutral principles are found in Opium?

Meconin, Meconoiosin and Porphyroxin.

Q.—What are the preparations of Opium?

Pulvis Opii, *Powdered Opium*,	dose gr. ss–iij
Opium Denarcotisatum, *Denarcotized*,	dose gr. ss–iij
Extractum Opii,	dose gr. ¼–j
Pilulæ Opii,	dose j–iij
Tinctura Opii, *Laudanum*, 10 per cent.	dose ♏v–xx
Tinctura Opii, Deodorata, *Deodorized Tincturæ of Opium*, 10 per cent.,	dose ♏v–xx
Vinum Opii, *Wine of Opium*, 10 per cent.,	dose ♏v–xx
Acetum Opii, *Vinegar of Opium*, 10 per cent.,	dose ♏v–xx
Tinctura Opii Camphorata, *Camphorated tincture of Opium*, *Paregoric*,	dose ʒj–iv
Liquor Opii Compositus, (Squibb) (unofficial ♏xj or gtt. xxij=about gr. j of Opium.)	
Tinctura Opii Composita (*Squibb's Diarrhea Mixture*) (unofficial),	dose for infants, gtt. j–x, for children, gtt. x–xxx, adults ʒj
Emplastrum Opii,	
Pulvis Ipecacuanhæ et Opii, *Dover's Powder*,	dose gr. v–xv
Tinctura Ipecacuanhæ et Opii,	dose ♏v-xv
Trochisci Glycyrrhizæ et Opii,	dose j–iv
Morphina, *Morphine*,	dose gr. $\frac{1}{20}$–j
Morphinæ Acetas, *Acetate of Morphine*,	dose gr. $\frac{1}{20}$–j
Morphinæ Hydrochloras, *Hydrochlorate of Morphine*,	dose gr. $\frac{1}{20}$–j

Morphinæ Sulphas, *Sulphate of Morphine*,	dose gr. $\frac{1}{20}$–j
Pulvis Morphinæ Compositus, *Tully's Powder*,	dose gr. v–xv
Tinctura Chloroformi et Morphinæ (B. P.), (a substitute far Chlorodyne q. v.).	
Trochisi Morphinæ et Ipecacuanhæ,	dose j
Liquor Morphinæ Sulphatis, *Magendie's Solution*, (unofficial, contains Morphina Sulphas gr. xvj to ℥j of Aquæ Dest.)	
Oleatum Morphinæ, *Oleate of Morphine*, unofficial, 10 per cent. for local use.	

Q.—What are the preparations of the other alkaloids?

Codeina, *Codeine*,	dose gr. ss–ij
Narcotina Hydrochloras, *Hydrochlorate of Narcotine* (unofficial),	dose gr. ij–x

NOTE.—Children bear Opium badly and for them its proportionate dosage should be much below that for other agents. Morphine should not be given to children below ten years of age, and never hypodermatically to those under fifteen years. Opium given to nursing women will affect the child, being partly excreted in the milk.

Q.—What are the reactions and incompatibles with Opium?

An aqueous or alcoholic preparation of Opium reddens litmus paper (free meconic acid), gives a deep red color with perchloride of iron (meconic acid); form precipitates with acetate and subacetate of lead, nitrate of silver, zinc, copper, and arsenic (meconates, sulphates, and coloring matter); forms a precipitate with tincture of galls or astringent preparations (tannates of morphine and codeine); and becomes turbid with the fixed alkalies, carbonates, alkaline ethers, and ammonia (precipitated morphine and narcotine).

Q.—What are the tests for Morphine?

Nitric acid produces a blood-red, turning orange, then yellow, then disappearing. Test solution of ferric chloride gives a blue color, changing to green with excess of the reagent, and destroyed by free acids or alcohol, but not by alkalies. Iodic acid liberates iodine which may be tested by starch.

Q—What are the physiological actions of Opium?

Opium is analgesic, hypnotic, antispasmodic, diaphoretic and narcotic. It depresses the circulation and respiration. A *moderate dose* at first stimulates, then calms, and finally depresses the cerebral functions, consciousness finally being lost in sleep, which is often disturbed by dreams, the reflex centres are depressed, and if the dose be toxic, finally paralyzed, death occurring from paralysis of the respiratory centre. The pupil is contracted from stimulation of the third pair of nerves. It depresses the cardiac motor ganglia, the pulse becoming slower and fuller, and the arterial tension elevated. Respiration is slowed. The secretions are all diminished, except that of the skin which is increased; peristalsis is retarded. Elimination takes place chiefly through the kidneys. Occasionally intense itching of the skin, and sometimes cutaneous rashes occur. Headache, nausea and constipation commonly follow a medium dose of Opium.

Q.—What are the symptoms of Opium poisoning?

Giddiness, stupor, clammy skin, slow full pulse, drowsiness and coma, with slow stertorous breathing and minutely contracted pupils, abolition of the reflexes and death from respiratory failure.

Q.—What is the treatment?

The chief indications are to evacuate the stomach, maintain respiration, and keep up the circulation. Atropine antagonizes its cerebral action, also its action on the pupil, respiration, heart, and arterial tension (?); but if given too freely will endanger the case by substituting belladonna narcosis for opium narcosis. Gr. $\frac{1}{120}$ hypodermatically every fifteen minutes for three doses, is generally sufficient. Strychnine, coffee, caffeine and cocaine are also physiological antagonists to morphine. Faradization of the chest muscles, cold affusion and artificial respiration are of great value. Flagellation is a dangerous procedure from the exhaustion produced; strong faradic currents are much more efficient. Evacuation of the bladder is important to prevent reabsorption.

Q.—How does the action of the alkaloids differ from that of Opium?

The action of Morphine is less constipating, less diaphoretic, and about four times more powerful in other respects. Codeine is uncertain as an anodyne and hypnotic, but appears to possess a sedative effect on the vagus, thus quieting cough and bronchial irritation. The results of experiments with the other alkaloids are so conflicting that no reliance can be placed on them.

Q.—What are the therapeutical uses of Opium?

The chief indications for the use of Opium are (1) to allay irritation; (2) to produce sleep; (3) to relieve pain; (4) to check excessive secretions; (5) to support the system; (6) as a sudorific. As an anodyne, Opium or Morphine is used in almost all diseases where pain is a prominent and persistent symptom, and is only contraindicated when acute inflammation of the brain is present.

As a hypnotic in delirium tremens (often combined with bromides or chloral), in sleepiness; to allay irritation, in severe acute vomiting; to check morbid discharges, or restrain peristalsis, as in cholera, diarrhea, dysentery, etc. In colds and muscular rheumatism, Dover's powder as a diaphoretic, conjoined with hot drinks and hot foot baths. In gastralgia, colic, spasms, serous inflammation, and cerebro-spinal meningitis. In superficial inflammation, opium or morphine locally are of great value. In diabetes mellitus, dyspnœa, cardiac disease, and hemorrhages.

Q.—What precaution is necessary in prescribing Opium.

The forming of the Opium habit.

Q.—What are the contraindications for the use of Opium?

Alcoholism, disease of the respiratory organs, advanced disease of the kidneys, and some forms of cerebral congestion and cardiac disease.

Q.—How is Opium administered?

In the form of the official preparations, either alone or in combination with other substances. The bromides, chloral or other hypnotics increase its soporific influence; belladonna, etc., enhance its anodyne effects, lead or other astringents make it act more powerfully in intestinal disorders; potassium nitrate, or minute doses of antimony, increase, while atropine diminishes the diaphoretic effect. It is administered by the mouth or rectum, and its alkaloids may be used hypodermatically.

Q.—What are the Dental uses of Opium?

Principally to relieve pain and inflammation. Ten grains of Dover powder at bed time will often prove serviceable in peridental inflammations. Tinct. of Opii in *hot* water (fʒij–f℥x) is a good local application in the same condition. For wounded and inflamed gum tissues after extraction, a lead and opium wash is of decided service. The salts of Morphina are recommended as topical applications to the pulp, and as an ingredient of nerve pastes. The acetate being preferable owing to its greater solubility. As an ingredient of mouth washes for tender and inflamed gums and mucous membrane, it has an anodyne effect. In the convulsions of dentition, carefully in small doses; in mercurial salivation to arrest excessive secretion and in neuralgia. As an injection into alveolar abscess it is often used in combination with tinct. iodine. The Wine of Opium is a more soothing and pleasant application than the Tinct. of Opium.

Q.—What effect has the Opium habit upon the teeth?

Cases are frequent in which the enamel and dentine are found to be thoroughly disintegrated, supposed to be due to the existence of erosive acids in the vitiated oral secretions.

Give a few prescriptions containing Opium.

For Lacerated and Painful Gums.

℞	Plumbi Acetatis,	gr. xv
	Tinct. Opii,	fʒij
	Aquæ dest.,	f℥iij

M. Signa: Used as a mouth wash.

For Pulpitis.

℞	Morph. Acetat.,	gr. xx
	Ol. Caryophyl, q. s. to make thin paste.	

(*Or*)

℞	Morph. Acetat.,	grs. v
	Ol. Cajeput,	fʒj
M.	Signa: Apply on cotton.	

As a Nerve Paste.

℞	Acidi Arseniosi,	gr. v
	Morph. Acetat.,	gr. x
M.	Creasoti, q. s. to make paste.	

HUMULUS—Hops.

Q.—What are Hops?

Hops are the fruit cones of the *Humulus Lupulus*, or hop vine (Nat. Ord. Urticaceæ.)

Q.—What do they contain?

Resin, tannin, a liquid alkaloid, volatile oil, *Lupulin*, and a bitter principle lupulinic acid.

Q.—What are the preparations of Hops?

Tinctura Humuli, *Tincture of Humulus*,	dose ʒss–ʒss
Lupulinum, *Lupulin*,	dose gr. ij–xv
Extractum Lupulini Fluidum,	dose ♏–xxx
Oleoresina Lupulini,	dose gr. ij–x
Infusum Lupulini (unofficial),	dose ℥j–ij
Tinctura Lupulini (unofficial),	dose ʒss–ij

Q.—What are the physiological actions of Hops?

Hops are tonic, astringent, slightly hypnotic, anaphrodisiac and diuretic. They increase the cardiac action and the cutaneous circulation.

Q.—What medicines are incompatible with Hops?

Mineral acids and metallic salts.

Q—What are the therapeutic uses of Hops?

They are used as a hypnotic in mild forms of tremens, in restlessness and sleeplessness from overwork, as an anaphrodisiac in priapism, chordee, nymphomia and satyriasis; as a diuretic and anodyne in irritation of the bladder, and locally as an anodyne.

Q.—What are the Dental uses of Hops?

As a mild hypnotic the hop-pillow is employed, and the hop poultice has long been a domestic remedy for the relief of local inflammations. As an analgesic, Lupulin is a valuable agent to the dentist conjoined with equal parts of acetanilid. The following has proved valuable in acute and chronic perecementitis and neuralgia.

℞ Acetanilid,
Lupulin, āā gr. xv
Mis. et ft. pil. in Cap. No. 6.
Signa: One capsule every three hours until relieved.

LACTUCARIUM—Lettuce.

Q.—What is Lacturcarium?

The concrete juice of *Lactuca virosa*, the acrid lettuce (Nat. Ord. Compositæ.)

Q.—What does it contain?

Lactucin, a bitter principle. *Lactucerin*, a neutral substance. *Lactucic Acid*, and other unimportant substances.

Q.—What are the preparations of Lactucarium?

Extractum Lactucarii Fluidum,	dose ♏x–ʒj
Syrupus Lactucarii, 5 per cent.,	dose ʒj–℥j

Q.—What are the physiological actions of Lactucarium?

Feebly hypnotic, sedative and diuretic. Supposed to act similarly to opium, but much more feebly and without depressing after-symptoms.

Q.—What is its Therapy?

As a substitute for opium, it has been used as a remedy for cough. The syrup is best employed as a vehicle for more active agents of the same class.

BROMINE AND BROMIDES.

Q.—What is Bromine?

A liquid non-metallic element, having the symbol *Br*. It is obtained from sea water and from certain saline springs. It is only used by inhalation and as an escharotic.

Q.—What are the official Bromides.

Potassii Bromidum, *Bromide of Potassium*, KBr,	dose gr. v–j
Sodii Bromidum, *Bromide of Sodium*, NaBr,	dose gr. v–j
Lithii Bromidum, *Bromide of Lithium*, LiBr,	dose gr. v–xx
Ammonii Bromidum, *Bromide of Ammonium*, NH_4Br,	dose gr. v–xx
Calcii Bromidum, *Bromide of Calcium*, $CaBr_2$,	dose gr v–ʒj
Zinci Bromidum, *Bromide of Zinc*, $ZnBr_3$,	dose gr. ss–ij
Arsenii Bromidum, *Bromide of Arsenic* (See Arsenic.)	
Camphora Monobromate, *Bromide of Camphor* (See Camphor.)	
Syrupus Ferri Bromidi, *Syrup of Bromide of Iron*, 10 per cent.	dose ʒss–j
Acidum Hydrobromicum Dilutum	dose ♏x–ʒij

Q.—What are the physiological actions of Bromine?

It is an active and painful escharotic, a deodorant and an antiseptic, setting free ozone. Internally it is a corrosive poison, producing violent gastritis, depression and collapse. Its vapor is highly irritant to the respiratory mucous membranes.

Q.—What are the physiological actions of the Bromides?

They are pre-eminently depressant of the cerebral and spinal functions, also alterative, antispasmodic and hypnotic. The potassium salt is especially a cardiac depressant and paralyzant. They are very diffusible, but slowly eliminated. They are decomposed in the blood, and irritant to the mucous membranes at the points of elimination (fauces, bronchi, intestines, skin and kidneys.) Continued for some time they produce gastric catarrh. They reduce the number of respirations and the heart's action and force, and though diminishing the caliber of the arterioles, they lower arterial tension. They lessen the activity of the brain cells, and diminish the sensibility of the peripheral nerves. They impair motility and the sexual function, cause pallor and emaciation, lowered body temperature, acne on the face and upper extremities, fetid breath, dysphagia, sluggish reflexes and defective co-ordination. If long continued, the mental faculties may become impaired, producing hallucinations and melancholia with suicidal intent, also incompetency of the sphincters and paralysis, beginning at the periphery and extending to the centres. The general result of this action is termed "Bromism."

Q.—How do the Bromides differ in their actions?

POTASSIUM BROMIDE is the most toxic to the heart and the muscular system, and is the least hypnotic. Bromine 66 per cent.

SODIUM BROMIDE is the least toxic, but the most hypnotic, and acts most energetically on the circulation. Bromine 78 per cent.

AMMONIUM BROMIDE resembles the Potassium salt in action, except that it exerts less influence on the heart and muscular system, and is somewhat more stimulating.

LITHIUM BROMIDE contains the most Bromine, 92 per cent., and resembles the Sodium salt in action. It is considered the best hypnotic of the series, and produces better results in some cases of epilepsy.

CALCIUM BROMIDE is an efficient hypnotic, but otherwise not very active.

BROMIDE OF ZINC produces effects similar to those of the other bromides, but in large doses is violently irritant.

FERROUS BROMIDE is official only in syrup. It is supposed to combine the actions of Iron and those of the Bromides, and to produce the effects of a sedative chalybeate tonic.

Q.—What are the antagonists and the incompatibles with the bromides?

Vaso-motor stimulants, as digitalis, ergot and belladonna, antagonize many of the effects of the Bromides, but morphine is the most efficient antagonist, especially for the mental symptoms. Nitrous Ether is incompatible with the Bromide of Ammonium, and acids and metallic salts are so with all the Bromides.

Q.—What are the therapeutic uses of Bromides?

The Bromides are used as sedatives to the nervous system, to lower reflex activity, to produce sleep, to subdue excitement of the genital apparatus, and to antagonize congestion of the brain. Their use has been greatly abused by patients, nurses and physicians. The combinations of Potassium Bromide with chloral are very unsafe in cases where fatty or weak heart exists, both drugs being active cardiac depressants.

The Bromides are used in convulsive and spasmodic affections, epilepsy, diabetes mellitus, acute rheumatism, muscular rheumatism, nervous erethism, insomnia, infantile colic, cholera infantum, cardiac irritability, delirium tremens, melancholia, whooping cough, seminal losses, nymphomania, tetanus, and subinvolution of the womb.

Bromine is not much used. In chancre, hospital gangrene, etc., it is a good escharotic, and in diphtheria, and membranous croup, a weak solution is successfully employed, both internally and by inhalation.

Hydrobromic Acid may be used as an alternate substitute for the Bromides in most all affections except epilepsy.

Q.—What are the Dental uses of the Bromides?

The Potassium salts seem to possess all the advantages required by the dental practitioner. It is a useful remedy in infantile convulsions of dentition, and also prevents such conditions by relieving the irritation. In neuralgia due to dental irritation, and when congestive in character, it is recommended in full doses, grs. xx–xxx, twice or thrice repeated, also locally to the pharynx and velum palati to diminish irritation of the fauces when in cases of cleft palate, an impression is to be taken. In extremely nervous and sensitive patients, a few doses prior to any dental operation, will greatly quiet and lessen irritability.

MOTOR DEPRESSANTS.

Q.—What remedies are classed as Motor Depressants?

Conium.
Pulsatilla.
Hydrocyanic Acid.
Gelsemium.
Veratrum.
Barium.
Curare.
Arnica.
Grindelia.
Pilocarpine.
Tobacco.
Quebracho.
Physostigma.
Lobelia.
Phytolacca.
Aconite.
Nitrites.
Ailanthus.

CONIUM—Hemlock.

Q.—What is Conium?

The full-grown fruit of *Conium maculatum*, the Spotted Hemlock (Nat. Ord. Umbelliferæ) gathered while yet green.

Q.—What does it contain?

A liquid, volatile alkaloid, *Coniine*, also *Methyl-coniine*, a solid alkaloid, *Conhydrine*, a volatile oil, and Coniic Acid.

Q.—What are the preparations of Conium?

Abstractum Conii, *Abstract of Conium*,	dose gr. ss–v
Extractum Conii Alcoholicum, *Alcoholic Extract of Coninm*,	dose gr. j–iij
Extractum Conii Fluidum,	dose ♏v–xv
Tinctura Conii,	dose ♏xx–ʒj
Coniina, *Coniine* (Unofficial),	♏ $\frac{1}{10}$–iij

NOTE.—The volatility of the active principle renders all preparations of Conium uncertain.

Q.—What are the physiological actions of Conium?

Conium is a gastric irritant, producing nausea and vomiting. The main action of Coniine is that of a paralyzant to the motor nervous system, beginning at the peripheral end-organs, and extending upwards, involving the nerve trunks, and finally the centres.

Q.—What are the symptoms of Conium poisoning?

Numbness and weakness of the legs, drooping eyelids, diplopia, slightly dilated pupils, vertigo, impaired utterance, slow and labored breathing, and death by paralysis of the muscles of respiration. The heart is not affected; and the mind is clear until CO_2 narcosis sets in, when it becomes torpid and indifferent.

Q.—What are the physiological antagonists of Conium?

Nux Vomica and its alkaloids, also picrotoxin and other tetanizers. Active exercise will hinder its toxic action from being fully developed.

Q.—What are the therapeutic uses of Conium?

Conium is used as a sedative to pain and to correct excessive motility. Large doses are required, as some physiological action is necessary. Children bear it well in chorea, whooping cough, pain and spasm coexisting, tetanus, etc. In acute mania, cancer, epilepsy, hysteria, etc., it is useful. In diseases of the eye and in strychnine poisoning; it is employed also to relax muscles in dislocations.

Q.—What are its Dental uses?

Conium is employed in neuralgia and locally applied in inflamed dental pulps; and also in cases of artificial teeth lodging in the œsophagus to produce relaxation of the muscles. The poisonous nature of the drug and its disagreeable mouse-like odor renders it objectionable about the mouth; it is not often used.

GELSEMIUM—Yellow Jasmine.

Q.—What is Gelsemium?

The rhizome and rootletts of *Gelsemium Sempervirens*, a climbing plant of the Nat. Ord. Loganiaceæ, indigenous in the Southern States.

Q.—What does it contain?

An alkaloid, *Gelsemine*, in combination with Gelsemic Acid, also a volatile oil and a resin.

Q.—What are the preparations of Gelsemium?

Tinctura Gelsemii,	dose ♏v–ʒj
Extractum Gelsemii Fluidum	dose ♏ij–xxx
Gelsemina, *Gelsemine*	dose gr. $\frac{1}{60}$–$\frac{1}{20}$

Q.—What are the physiological actions of Gelsemium?

Gelsemium is an antispasmodic, a diaphoretic and nervous depressant, paralyzing motility and sensibility by central action on the spinal cord. It is also anaphrodisiac. In moderate doses it causes languor, slowing of the cardiac rate, feebleness of muscular action, impaired sensibility, drooping eyelids, and dilated pupils with diaphoresis. A toxic dose produces vertigo, diplopia, drooped eyelids, dilated pupils (paralysis of the third nerve), labored breathing, slow and feeble heart, dropped jaw, staggering gait, great muscular weakness and almost complete general anæsthesia, profuse sweats, loss of articulation and death by asphyxia (paralysis of muscles of respiration). Consciousness is preserved until CO_2 narcosis sets in. Convulsions do not occur in man, but do in lower animals. It is not an arterial depressant, but produces a decided lowering of the body temperature.

Q.—What are the antagonists and incompatibles?

Opium is the antagonist, so also are ammonia, alcohol, etc. Emetics, heat, artificial respiration and faradism of the muscles of respiration are measures of prime importance in poisoning by this drug. The caustic alkalies and tannic acid are chemically incompatible.

Q.—What are the therapeutic uses of Gelsemium?

Gelsemium is indicated in all conditions of exalted nerve functions; contra-indicated wherever there is weak heart. It is well used in cerebro-spinal meningitis, mania, delirium tremens, pneumonia and pleuritis; cough, neuralgia of the fifth nerve, after-pains, ovarian neuralgia, dysmenorrhœa and irritable bladder of women.

Q.—What are the Dental uses of Gelsemium?

Gelsemium is greatly extolled as a remedy for neuralgia of the fifth nerve, often affording permanent relief when the affection is associated with diseased teeth. The dose may be repeated at any time after an hour and a half if the pain is not relieved. A third dose is seldom required. In neuralgia of the face or head, three minim doses of the tincture every half hour will often act very beneficially and leave no ill effects. Owing to the toxic action of the drug, care is necessary that the dose is moderate and the symptoms carefully watched. Gorgas recommends the following for neuralgia from devitalized teeth.

℞ Tinct. gelsemii,	gtt. x
Tinct. Aconiti,	gtt. v
Aquæ dest.,	℥ iv

M. Signa: One teaspoonful every hour.

CURARE—Woorara.

Q.—What is Curare?

A vegetable extract obtained from various plants of the Strychnos family, and used by the South American Indians as an arrow poison.

Q.—What does it contain?

Its active principle is the alkaloid *Curarine*, which contains no oxygen. It contains no strychnine, nor any tetanizing principle.

Q.—What are the preparations of Curare?

Curare gr. $\frac{1}{10}$ hypodermatically; or ♏x–xv of a solution of gr. j in ʒij.

Curarina, *Curarine*, $\frac{1}{200}$ hypodermatically, or $\frac{1}{50}$ by the stomach.

Caroval, Vao, are names of native preparations.

None of the above are official.

Q.—What are the physiological actions of Curare?

Its absorption from the stomach is very slow and it is eliminated so rapidly that when taken internally no symptoms result, but when injected beneath the skin it rapidly produces a general muscular paralysis including the muscles of respiration. Primarily the heart and the brain are not affected, the voluntary muscles are influenced. Small doses increase all the secretions, and it is eliminated chiefly by the kidneys.

Q.—How do the actions of Curare, Coniine, and Gelsemine compare?

Curare and Coniine paralyze the end organs of the motor nerves, Gelsemine and Methyl-Coniine paralyze the motor centres.

Q.—What are the antagonists of Curare?

Artificial respiration to maintain life until elimination occurs. Evacuation of the bladder repeatedly, and strychnine.

Q.—What are the therapeutic uses of Curare?

It has been used with some success in spasmodic nervous affections, particularly in tetanus, both idiopathic and traumatic, hydrophobia, chorea, and epilepsy.

PILOCARPUS—Jaborandi.

Q.—What is Pilocarpus?

The leaflet of *Pilocarpus pennatifolius*, a Brazilian plant (Nat. Ord. Rutaceæ).

Q.—What does it contain?

It contains two alkaloids, *Pilocarpine* and *Jaborine* which, though isomeric, are antagonistic in action; also a volatile oil and probably a peculiar acid.

Q.—What are the preparations of Pilocarpus?

Extractum Pilocarpi Fluidum,	dose ♏v–ʒj
Pilocarpinæ Hydrochloras,	gr. $\frac{1}{20}$–$\frac{1}{2}$. Hypodermatically $\frac{1}{6}$.

Q.—What are the physiological actions of Pilocarpus?

Pilocarpus is a paralyzer of the vaso-motor system, and a stimulant of the peripheral termination of nerves supplying glands and involuntary muscular fibre, subsequently paralyzing the latter. It is therefore a powerful diaphoretic and sialogogue, a cardiac depressant by stimulation of the vagus ends, also myotic, emetic, and under some circumstances abortifacient. The nasal, bronchial and lachrymal secretions are much increased, the action of the heart at first increased is afterwards lowered, the arterial tension is reduced, and the temperature falls from 1° to 4°.

Q.—What is the antagonist?

Atropine for Pilocarpine. Morphine controls the nausea and vomiting.

Q.—What is its therapy?

Ptyalism, diphtheria and erysipelas, amblyopia, inflammations of serous membranes, dropsy, diabetes insipidus, agalactia, uræmia and Bright's disease,

Q.—For what purposes has Jaborandi been recommended in Dental practice?

Several cases of "*Dry Mouth*" have been reported that yielded nicely to the action of Jaborandi.

PHYSOSTIGMA—Calabar Bean.

Q.—What is Physostigma?

The seeds of *Physostigma venenosum* (Nat. Ord. Leguminosæ), a woody creeper of Calabar, West Africa.

Q.—What does it contain?

An alkaloid which is variously called *Eserine*, *Calaberine* and *Physostigmine*, also albuminous matter, starch and oil.

Q.—What are the preparations of Physostigma?

Extractum Physostigmatis,	dose gr. $\frac{1}{16}$–$\frac{1}{2}$
Tinctura Physostigmatis, 10 per cent.	dose ♏v–xx
Physostigminæ Salicylas, *Salicylate of Physostigmine*	dose $\frac{1}{100}$–$\frac{1}{60}$
Eserina, *Eserine* (unofficial),	dose gr. $\frac{1}{60}$–$\frac{1}{12}$

Q.—What are the physiological actions of Physostigma?

Physostigma is a muscular stimulant and a direct spinal paralyzer, producing complete general paralysis, and abolishment of the reflexes, but does not affect muscular irritability or the brain. It stimulates the secretions, excites nausea and vomiting, and is laxative. It first lowers, then raises the arterial tension, increases the heart-beat in frequency, but depresses the power of the cardiac muscle. It contracts the pupils, and is eliminated chiefly by the kidneys.

Q.—What are the physiological antagonists?

Atropine, as to the respiration, heart and pupil. Chloral is also antagonistic, but to be effective must be administered some time before the ingestion of the Physostigma.

Q.—What is its therapy?

Physostigma has but a small field of action. It is used as a depresso-motor in tetanus, trismus neonatorum, epilepsy and chorea with some success. As an antagonist to strychnine poisoning, and in habitual constipation. The alkaloids are used in ocular therapeutics, to prevent or overcome adhesions of the iris, lessen tension and contract the pupil.

ACONITUM—Aconite.

Q.—What is Aconite?

The tuberous root of *Aconitum Napellus*, a perennial plant (Nat. Ord. Ranunculaceæ). The whole plant is active.

Q.—What does it contain?

The active principle of Aconite, is the alkaloid *Aconitine*, which it contains in the proportion of .03 per cent., together with Aconitic Acid. Four other alkaloids have been found in it; *pseudaconitine*, *aconine*, *pseudaconine*, *and picraconitine*, but the chemistry of Aconite is not well settled.

Q.—What are the preparations of Aconite?

Abstractum Aconiti,	dose gr. $\frac{1}{4}$–j
Extractum Aconiti,	dose gr. $\frac{1}{6}$–$\frac{1}{3}$
Extractum Aconiti Fluidum,	dose ♏ss–ij
Tincture Aconiti,	dose ♏ss–iv

(St. Jacob's oil is a weak Aconite liniment).

Q.—What are the physiological actions of Aconite?

Aconite is a powerful sensory, cardiac, respiratory and spinal depressant, also diaphoretic, diuretic and antipyretic. It chiefly affects the peripheral ends of the sensory nerves, but paralyzes both motor and sensory.

Locally applied it paralyzes the sensory nerves of the part producing its characteristic numbness and tingling.

Q.—What are its physiological antagonists?

Atropine, Morphine and Ammonia antagonize its effect on the heart and respiration. Digitalis counteracts its heart action and the relaxation of the heart and respiration.

Q.—What are the symptoms of Aconite poisoning?

Overpowering sense of fatigue in the lower extremities, great muscular weakness, dimness of vision, with dilated pupils; great dyspnœa, the respiration being short and labored, the pulse at first slow and small, afterwards imperceptible, surface of body, tongue and breath cold, profuse perspiration, muscles of respiration paralyzed; ceasing of the heart's action.

Q.—What is its therapy?

Aconite antagonizes the fever process. It has been called the "therapeutic lancet," and is responsible to a great extent for the disuse into which venesection has fallen. Its power over the circulation, respiration and transpiration render it of the greatest value in all affections characterized by high resisting pulse, dry, hot skin and elevated body temperature. It is especially useful in acute throat affections, acute inflammation of the respiratory organs, acute pleuritis and peritonitis, simple and eruptive fevers, puerperal fever, surgical fever, erysipelas of the face, acute rheumatism, cardiac affections, menstrual suppressions and neuralgia, especially of the face and brow.

Q.—What are the Dental uses of Aconite?

In dental practice Aconite is used both internally and topically. Internally to influence the circulation, as it reduces the pulse rate and lowers arterial tension, at the same time lowering the temperature and causing diaphoresis and diuresis. Topically it paralyzes the sensory nerves of the part and lessens the excitement to the local afflux of blood, favoring resolution and limiting the extent of an abscess when pus is already formed. In the incipient stages of peridental inflammation it retards the circulation and stimulates lymphatic action.

Q.—For this purpose how is this usually applied?

Conjoined with equal parts of tinct. iodine, and painted upon the dry gums; or, apply the aconite first, and after a moment the iodine.

Q.—Is Aconite ever applied to the Dental Pulp?

In cases of inflamed pulps aconite is serviceable in conjunction with chloroform, oil of cloves, capsicum, etc. For this purpose St. Jacob's oil (patent medicine) is very satisfactory.

Q.—Is Aconite used as a dressing for pulp canals?

Yes, as it *prevents* the formation of inflammatory products.

Q.—Is it used as a Local Anæsthetic?

Yes; combined with chloroform, menthol, etc., it will also subdue the pains after extraction when caused by inflammation.

Q.—How is it usually applied in neuralgia?

The alkaloid Aconitine (not official) is usually applied, or liniment may be made from any of its preparations.

Q.—What precautions are essential in the use of Aconite?

As it is a powerful poison, the dose being very small, it should rarely be trusted to the patient, but used in the office, with a strict regard for its dangers.

Give a few formulæ containing Aconite.

The following are recommended:

For Odontalgia.

℞	Tinct. Aconiti,	
	Chloroformi,	āā fʒiij
	Tinct. Capsici,	fʒj
	Tinct. Pyrethri,	
	Ol. Caryophilli,	āā f℥ss
	Gum Camph.,	℥ss

M. Signa: To be applied on a pellet of cotton. (GORGAS).

As a Local Anæsthetic.

℞	Tinct. Aconiti,	f℥j
	Mentholis,	gr. x
	Chloroformi,	fʒj

M. Signa: Apply to gum about the tooth for several minutes.
(GORGAS).

For Neuralgia.

℞ Liniment Aconiti,
Linimenti Belladonnæ, āā ʒvij
Chloroformi, ʒij
M. Signa: Apply, on lint, to the part affected, and cover with a fine piece of sponge saturated with warm water. (GORGAS).

For Acute Pericementitis.

℞ Tinct. Aconiti, ʒj
Creasoti (pure wood),
Tinct. Iodi,
Spts. Camph., āā ʒss
M. Signa: Apply to gum, one or two drops at the cervical border. (STEVENS).

For Neuralgia (Internally).

℞ Tinct. Aconiti,
Tinct. Colchici Sem,
Tinct. Belladonnæ,
Tinct. Cimicifugæ, āā ʒij
M. Signa: Six drops every six hours until relieved.

PULSATILLA—Pasque-Flower.

Q.—What is Pulsatilla?

Pulsatilla is the herb, collected soon after flowering, of *Anemone Pulsatilla* and other species of Anemone (Nat. Ord. Ranunculaceæ).

Q.—What does it contain?

An acid, oily principle which with age separates into *Anemonin*, a volatile camphoraceous principle, and *Anemonic Acid.*

Q.—What are the preparations of Pulsatilla?

The herb alone is official, though a tincture may be made and used in doses of ♏$\frac{1}{10}$-x.

Anemoninum, *Anemonin* (unofficial) dose gr. $\frac{1}{10}$-ij in pill.

Q.—What is its physiological action?

Locally it is an irritant. Internally it depresses the circulation and lowers the blood pressure. In poisonous doses it causes vomiting and purging, dilated pupils convulsions, paralysis, diminished sensation, coma and death.

Q.—What is its therapy?

Pulsatilla is not much used, as it is decidedly inferior to other cardiac sedatives. It has been employed in uterine affections, epididmitis, dyspepsia, coryza, coughs, tapeworm and cutaneous affections.

VERATRUM—Hellebore.

Q.—What are the different forms of Veratrum?

(1) Veratrum viride, *American Hellebore.*

(2) Veratrum album, *European Hellebore.*

(3) Veratrum sabadilla, or Asagræa officinalis, *Mexican Hellebore.*

The first alone is official in U. S. P., though the third furnishes an alkaloid *Veratrine*, that is recognized.

Q.—What do these plants contain?

No. 1. Jervine, Pseudo-jervine, Cevadine, Rubijervine.
No. 2. Jervine, Veratralbine, Pseudo-jervine, Rubijervine.
No. 3. Veratrine, Cevadine, Cevadilline.

NOTE.—*Veratroidine*, formerly regarded as one of the alkaloids, is now thought to be Rubijervine.

Q.—What are the preparations of Veratrum?

Tinctura Veratri Viridis, dose ♏ij–x, a 50 per cent. tincture of the root.
Extractum Veratri Viridis Fluidum, dose ♏j–v, also from the root.
Veratrina, *Veratrine*, gr. $\frac{1}{50}$–$\frac{1}{10}$, from the seeds of V. Sabadilla.
Oleatum Veratrinæ, *Oleate of Veratrine*, strength 2 per cent.
Unguentum Veratrinæ, *Ointment of Veratrine*, strength 4 per cent.
Norwood's Tincture of Veratrum Viride (unofficial) dose ♏–v.

Q.—What are the physiological actions of Veratrum Viride?

Its action is closely allied to that of aconite, being a powerful cardiac depressant and spinal paralyzant. It differs from aconite in affecting the respiration to a much less extent, in being a systemic emeto-cathartic, in paralyzing the motor system centrally, impairing the reflexes but leaving sensation unimpaired, and in having little or no diaphoretic or diuretic action. It causes great depression, but is seldom fatal; when death does result it usually occurs by paralysis of the heart. The depressant action of the drug is to a certain extent due to the alkaloid jervine.

Q.—What is the physiological action of Veratrina?

Locally it is irritant, causing heat and pain, followed by numbness. Small doses weaken the pulse and reduce its frequency. Large doses cause vomiting and purging and muscular weakness. Veratrine seems to stimulate the excito-motor cardiac ganglia and muscle (temporarily increasing the pulse) but soon depresses and finally paralyzes them. It excites and then destroys the function of the vagi. It depresses and finally paralyzes the respiratory centre, death occurring from this cause.

Q.—How should dangerous cases be treated?

With alcohol and other cardiac stimulants.

Q—What are the therapeutic uses of Veratrum Viride?

Veratrum Viride is inferior to aconite in fevers and inflammation, by reason of its lack of power over excretion. In acute lobar pneumonia it is considered safer than aconite. In acute mania and in mania-a-potu (when the patient is strong and the pulse full and bounding) it is a valuable medicine, but should never be given in delirium tremens. In puerperal eclampsia it is sometimes efficient.

Q.—What are the therapeutic uses of Veratrine?

It is chiefly used as an external application in rheumatic pain and in neuralgia.

Q.—What are the Dental uses of Veratrine?

In the form of the ointment it is used in facial and other forms of neuralgia, a small quantity being rubbed over the seat of the pain. It is also used as an obtundent in sensitive dention.

Give a few prescriptions containing Veratrine.

For Sensitive Dentine.

℞.	Veratrina,	gr. iv
	Acidi Tannici,	gr. j
	Alcoholis,	gtt. xx
	Glycerini,	f℥i
	Acidi Carbolici,	℥ij

M. Signa: Dry the tooth thoroughly and apply to sensitive surface

(BOGUE.)

For Facial Neuralgia.

℞	Veratrinæ,	gr. iv
	Aconitinæ,	gr. ij
	Olei Tiglii,	gtt. ij
	Olei Olivæ,	ʒij

M. Signa: Rub over affected spot thrice daily. (GARRETSON.)

ARNICA AND TRIMETHYLAMINE.

Q.—What is Arnica?

The flower-heads and the rhizome and rootlets of *Arnica Montana*, Leopard's Bane, (Nat. Ord. Compositæ.)

Q.—What does it contain?

It contains a glucoside *Arnicin*, a volatile oil, inulin, tannin, mucilage resins, capronic and caprylic acids. It also contains *Trimethylamine*, which is supposed to be the active principle, and to be yielded by the oil.

Q.—What is Trimethylamine?

An ammonical liquid substance, having a strong fishy odor, composed of carbon, hydrogen and nitrogen. It exists in ergot, in urine, and in the brain of herrings.

Q.—What portions of the plant are official?

Arnicæ Flores, *Arnica Flowers*, Arnicæ Radix, *Arnica Root*.

Q—What are the preparations of the flowers?

Tinctura Arnicæ Florum, 20 per cent.	dose ♏v–xxx
Infusum Arnicæ (unofficial),	(For local use.)

Q.—What are the preparations of the root?

Extractum Arnicæ Radicis,	dose gr. j–iij
Extractum Arnicæ Radicis Fluidum,	dose ♏v–xx
Tinctura Arnicæ Radicis, 10 per cent.	dose ♏v–xxx
Emplastrum Arnicæ, contains Ex. of Arnica root, 50 parts to 100 of lead plaster.	
Trimethylaminæ Chloridum,	dose gr. j–v

Q.—What are the physiological actions of Arnica?

Arnica is stimulant, irritant, depressant, antipyretic, diuretic, and a vulnerary. It irritates the gastro-intestinal tract, and in alcoholic solution excites erysipelatous inflammation of the skin in some persons. Internally it slows the heart, but seems to raise the arterial tension slightly. A toxic dose paralyzes the nervous system, causing collapse and death.

Q.—What are the physiological effects of Trimethylamine?

It is an active escharotic, and a gastro-intestinal irritant; lowers the rate and force of the heart. decreases the body temperature and diminishes (sometimes increases) the excretion of urea.

Q.—What are the therapeutic uses of Arnica?

Arnica is seldom used in this country except as an external application to sprains and bruises, for which purpose an infusion is better, the tincture being liable to excite dermatitis. It has, however, been used in typhoid and typhus fevers, rheumatism, hemorrhages, concussion of the brain, chronic dysentery, paralysis of the bladder, chorea, etc. Trimethylamine is used as a liniment for its anodyne effect.

Q.—What are the Dental uses for Arnica?

The tincture is used to irritable pulps of teeth, in pericementitis to prevent suppuration, to wounds of the mucous membrane of the mouth, and combined with glycerin, to abraded surfaces caused by artificial teeth, and to ulcers in the mouth. The tincture of Arnica, when largely diluted with water and glycerin, forms an efficient mouth wash.

Give a few prescriptions containing Arnica.

For Abraded Surfaces of the Mouth.

℞	Tincturæ Arnicæ,	
	Glycerini,	āā ℥j
M.	Signa: To be used as a lotion.	

For Ecchymosis.

℞	Tinct. Arnicæ,	
	Liquor Ammonii Muriat,	āā ℥ss
	Aquæ,	℥v
M.	Signa: To be applied as a lotion.	

For Astringent Mouth Wash after Extraction.

℞	Tinct. Myrrhæ,	℥j
	Tinct. Arnicæ,	℥ss
	Acidi Carbolici,	gtt. xx
	Olei Gaultheriæ,	gtt. xv
M.	Signa: Use a small quantity in water several times daily.	

TABACUM—Tobacco.

Q.—What is Tobacco?

The commercial dried leaves of *Nicotiana Tabacum* (Nat. Ord. Solanaceæ), a native of tropical America.

Q.—What does it contain?

A powerful liquid alkaloid *Nicotine*, together with malic acid, alkaline salts, and a peculiar camphor named *Nicotianin*, and an empyreumatic oil.

Q.—What other liquid alkaloids are contained in Tobacco?

Lupuline, Coniine, Lobeline, Piperidine, Pyridine, Muscarine, Sparteine, and the alkaloidal compound Trimethylamine.

Q.—What are the preparations of Tobacco?

Tabacum is the only official preparation. Unofficial we have:

Infusum Tabaci,	dose ℥ss-iij as enema. (Dangerous).
Vinum Tabaci,	dose ♏v-ʒj, Cautiously.
Oleum Tabaci.	
Nicotina, *Nicotine*,	dose ♏$\frac{1}{20}$-$\frac{1}{10}$ up to ♏ij in Strychnine poisoning.
Pyridina, *Pyridine*,	dose ʒj-ʒiss, allowed to evaporate in an open dish in a small room, in which the patient is exposed for 20 or 30 minutes thrice daily. (Seé).

Q.—What are the physiological actions of Tobacco?

Tobacco is a depressing nauseant, an emetic by systemic and irritant action, a sternutatory, diuretic, diaphoretic, cathartic, sedative, antispasmodic and narcotic. It first stimulates and afterwards paralyzes the motor nerves of involuntary muscles and the secreting nerves of glands, also the spinal cord and the vagus. It contracts the pupils, slows and depresses the heart, first lowers and then raises the arterial tension and reduces the body temperature. Death usually by paralysis of respiration, but sometimes by paralysis of the heart. It does not impair muscular irritability, nor does it act on the cerebrum directly.

Q.—What is the effect of the continued use of Tobacco by smoking or chewing?

It produces granular inflammation of the fauces and pharynx, atrophy of the retina, dyspepsia, lowered sexual power, sudden faints, nervous depression, cardiac irritability and occasionally angina pectoris.

Q.—What effect has its use upon the young?

It hinders the development of the higher nervous centres, and impairs the nutrition of the body by interfering with the processes of digestion and assimilation.

Q.—What is said of Nicotine?

Nicotine is almost as rapidly fatal as prussic acid; death having occurred from a toxic dose in three minutes, with no symptoms except a wild stare and a deep sigh.

Q.—What is the treatment in Tobacco poisoning?

Emetics or washing out the stomach, tannic acid and strychnine with artificial respiration. Alcohol, ammonia, ergot, etc., antagonize its action on the circulation.

Q.—What are the therapeutic uses of Tobacco?

Tobacco is not much used in medicine, owing to the dangers attending its employment. As a local anodyne it has been used as an ointment to inflamed hemorrhoids, and as a lotion to relieve pruritus. Great caution should be observed, as its local use has resulted in poisoning and death.

LOBELIA—Indian Tobacco.

Q.—What is Lobelia?

The leaves and tops of *Lobelia inflata* (Nat. Ord. Lobeliaceæ) a North American weed.

Q.—What does it contain?

A liquid alkaloid *Lobeline;* also *Lobelic Acid*, *Lobelacin*, resin, wax, etc.

Q.—What are the preparations of Lobelia?

Tinctura Lobeliæ, 20 per cent.	♏v-xxx
Extractum Lobeliæ Fluidum,	♏j-x
Acetum Lobeliæ, ten per cent.	♏v-ʒj
Lobelin, a resinoid (unofficial)	gr. ss j

Q.—What are the physiological actions of Lobelia?

Lobelia has an acrid, nauseous taste, and a very unpleasant odor. It is expectorant, diaphoretic, purgative, emetic, antispasmodic and narcotic. The motor nervous system is chiefly affected, especially the medulla and the nucleus of the pneumogastric contained therein.

Q.—What are its antagonists?

Strychnine, picrotoxin, thebaine, antagonize its action on the nervous system; the vaso-motor excitants, as alcohol, digitalis, belladonna, oppose its effects on the circulation.

Q.—What are the therapeutic uses of Lobelia?

It is used as a depresso-motor and expectorant in asthma and in acute bronchitis, in spasmodic diseases it has been superseded by more reliable and less dangerous remedies. Locally an infusion (ʒj to Oj) is recommended as an application to *poison-oak-eczema*.

THE NITRITES.

Q.—What are Nitrites?

The Nitrites are salts formed by the union of nitrous acid with a base.*

Q.—What Nitrites are in medicinal use?

Amyl Nitris, *Nitrite of Amyl*, is the only one official. Others are in use as Sodii Nitris, *Nitrite of Sodium*, Potasii Nitris, *Nitrite of Potassium* and *Ethyl Nitrite*, Nitro-glycerinum, *Nitroglycerin*, *Glonoin*, *Trinitrin*, *Trinitrite*, *of Glyceryl*.

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*The terminations —ide —ite, —ate; whenever a salt ends in —ide it is formed by the union of an element with a base (thus, iron oxide, iron and oxygen). When a salt ends in —ate, it shows the union of an acid ending in —ic with a base (thus, iron phosphate, iron and phosphoric acid.) When a salt ends in —ite, it is composed of an acid ending in —ous and a base (thus, sodium sulphate, sodium and sulphurous acid.)

Q.—What preparations of Nitroglycerin are used though unofficial?

Tinctura Nitroglycerini, a one per cent.
solution in alcohol, dose ♏ ½–x
Tabellæ Nitroglycerini (B. P.) each contains $\frac{1}{100}$.

Q.—Is Nitroglycerini really a Nitrite?

No; it is a Nitrate, as it is formed by the action of Nitric and Sulphuric Acids on Glycerin.

Q.—How is Nitrite of Amyl produced?

By the action of Nitric or Nitrous Acid upon Amylic Alcohol, or fusel oil.

Q.—What are its physical properties?

It is a clear, yellowish, oily liquid, of a powerful ethereal odor, extremely volatile, insoluble in water, but soluble in alcohol, ether, chloroform and benzin.

Q.—What are the physiological actions of Nitrites?

The Nitrites agree in their general action, producing great vascular dilatation, and consequent lowering of blood pressure by paralyzing either the sympathetic system, the vaso-motor centre, or the muscular coat of the arterioles; tumultous action of the heart, by relaxation of its inhibitory apparatus; diminished sensation, motion and reflexes; a sensation of heat, but lowered body temperature; lowered respiration from paralysis of the respiratory muscles and impairment of the ozonizing function of the blood; throbbing pain in the head, beating carotids, flushed face and vertigo. They are all muscle poisons.

Amyl Nitrite is the most prompt but less enduring in action, and is best given by inhalation. Nitrite of Sodium acts similarly but less promptly. Nitro-glycerin is less prompt and less violent, has a more enduring action, and is therefore more suitable for internal administration. The action of all these agents is probably due to the Nitrous Acid contained in them.

Q.—What are the physiological antagonists of the Nitrites?

All agents which increase the functional activity of the spinal cord and sympathetic. Ergot, belladonna, strychnine, etc.; stimulants, artificial respiration, the alternate cold and hot douche, with cold to the head, and ergotin, or atropine subcutaneously, are the best means to be used in cases of poisoning by the Nitrites.

Q.—What are the therapeutic uses of the Nitrites?

The Nitrites are used (1) as depresso-motors, to relax spasm, in angina pectoris, asthma, tetanus, convulsions, strychnine poisoning, congestive and nervous dysmenorrhœa, and in all cases of very high arterial tension from spasm of the arterioles Nitro-Glycerin has proved of value in chronic interstitial nephritis and in obstinate hiccough. (2) As a cardiac stimulant in syncope, cardiac dyspnœa, and in threatened cardiac failure during the administration of anæsthetics, especially chloroform and cocaine, (3) They have also been found useful in the nausea and vomiting of sea-sickness and pregnancy.

Q.—What are the Dental uses of the Nitrites?

Nitro-Glycerin has been used with success in neuralgias of the trigmenini. Amyl Nitrite is used as an antagonist in threatened narcosis from an anæsthetic, for the relief of neuralgia, and from epileptic attacks during extraction, etc., being administered by inhalation.

Q.—How is Amyl Nitrite supposed to counteract the action of an anæsthetic?

It is supposed to antagonize cerebral anæmia, by producing capillary dilatation, and thus favoring the flow of blood to the brain.

Q.—What is the dose of Amyl Nitrite?

The dose is ♏ij–v by inhalation, not more than ♏iij, unless the patient is accustomed to its use. It is usually retailed in glass pearls containing ♏j–v.

ACIDUM HYDROCYANICUM—Prussic Acid.

Q.—What is Hydrocyanic Acid?

A compound of Cyanogen and Hydrogen, HCN. It exists ready formed in the juice of the bitter cassava, and may be obtained from bitter almonds, kernels of plums, peaches, cherry laurel, etc. It is used in medicine only in a largely diluted solution.

Q.—What are the preparations of Hydrocyanic Acid?

Acidum Hydrocyanicum Dilutum, 2 per cent.,	dose ♏j–v

Name other preparations containing this acid.

Aqua Laurocerasi, *Cherry - Laurel water* (unofficial)	dose ♏v–xxx
Oleum Amygdalæ Amaræ, *Oil of Bitter Almond*,	dose ♏$\frac{1}{4}$–j in mixture
Potassii Cyanidum,	dose gr. $\frac{1}{20}$–$\frac{1}{10}$
Potassii Ferrocyanidum,	dose gr. v–xv

Q.—What are the physiological actions of Hydrocyanic Acid?

Hydrocyanic Acid and Nicotine are the most powerful and rapid poisons known. When its vapor is inhaled, or when the acid is taken in sufficient doses, it kills almost immediately from arrest of circulation. Prussic Acid is a direct nerve and muscle poison; in small doses it slows the heart by stimulation of the inhibitory centres, in large doses it causes diastolic arrest by direct action on the heart muscle or its contained ganglia. The blood is found on post-mortem examination to be dark and fluid, and the nervous trunks and cerebral sinuses gorged therewith. The effects of a medicinal dose pass off in half an hour at most.

Q.—How may the presence of Prussic Acid be detected?

The addition of a solution of Silver Nitrate produces a white precipitate, entirely soluble in boiling concentrated Nitric Acid.

Q.—What are the physiological antagonists?

Atropine has antagonistic action, but is too slowly diffused to be of any value. Ammonia by inhalation, by the stomach, and by intravenous injection, with cold affusion to the spine and artificial respiration, are the measures most likely to avail in cases of poisoning, where there is time.

Q.—What is the Antidote to Cyanide of Potassium?

Sulphate of Iron, producing Ferrocyanide of Iron (Prussian Blue).

Q.—What are the therapeutic uses of these agents?

Coughs, gastralgia, acute mania and melancholia, round worms, skin diseases, headaches, etc. The stains of Nitrate of Silver are removed by a solution of Cyanide of Potassium, gr.-iij-v to the f℥.

BARIUM—Barium.

Q.—What is Barium?

Barium is a dyad metallic element, so named from the great specific gravity of the native carbonate and sulphate.

Q.—What preparation of Barium is used?

Only one, Barii Chloridum dose gr. $\frac{1}{10}$-ss.

(Other preparations are useful in the laboratory.)

Q.—What are its physiological actions?

Barium excites secretion and salivation, is a great intestinal irritant and causes nausea, vomiting and purging. It paralyzes the nervous system, death occurring by paralysis of respiration.

Q.—What are its therapeutic uses?

Originally employed as an alterative, it has fallen into disuse. It is useful in aneurism and hemorrhages owing to its contractile power over the vessels.

Q.—What preparation of Barium is of interest to the dentist?

Barium Dioxide, used in the manufacture of Hydrogen Dioxide.

GRINDELIA—Grindelia.

Q.—What is the source of Grindelia?

Grindelia is the leaves and tops of *Grindelia robusta* (Nat. Ord. Compositæ) an herbaceous Californian plant.

Q.—What does it contain?

Its composition is *probably* an alkaloid, a resin and a volatile oil.

Q.—What are its preparations?

Only one is official.

Extractum Grindeliæ Fluidum,	♏v–ʒj
Tinctura Grindeliæ (unofficial),	♏x–ʒij
Extractum Grindeliæ (unofficial),	gr. ij–v in pill

Q.—What are its physiological actions?

It depresses the motor nerves and muscles, and in large doses tends to slow the heart and reduce the blood pressure. It is markedly diuretic.

Q.—What are its therapeutic uses?

Spasmodic asthma, hay fever, chronic bronchitis and emphysema, whooping cough, spasmodic dyspnœa, chronic pyelitis and cystitis and in rhus poisoning.

QUEBRACHO—Quebracho.

Q.—What is Quebracho?

The bark of *Aspidosperma Quebracho*, an evergreen tree growing in Chili and the Argentine Republic.

Q.—What does it contain?

It is supposed to contain six alkaloids, the most important of which are *Aspidospermine, Quebrachine and Aspidosamine.*

Q.—What are its preparatious?

Vinum Quebracho,	ʒj–℥j
Tinctura Quebracho,	ʒj–ʒij
Extractum Quebracho Fluidum,	♏v–ʒj

(All unofficial.)

Q.—What are its physiological actions?

Quebracho in large doses causes severe salivation, nausea, vomiting, vertigo and headache. It lessens the rate of respiration, and seems to decrease the sensation of need for air after active exertion.

Q.—What are its therapeutic uses?

Dyspnœa from any cause (?)

PHYTOLACCA—Poke.

Q.—What is Phytolacca?

The berry and root of *Phytolacca decandra* (Nat. Ord. Phytolaccaceæ) a North American plant.

Q.—What does it contain?

A neutral principle, *Phytolaccin*, also Phytolaccic Acid, tannin, starch and a fixed oil, etc.

Q.—What are its preparations?

Phytolaccæ Bacca, *Poke Berry.*	
Phytolaccæ Radix, *Poke Root,*	gr. j to ʒss
Tinctura Phytolaccæ,	♏x–ʒj
Extr. Phytolaccæ Fluidum,	♏v–ʒss

(The last two are unofficial.)

Q.—What are its physiological actions?

Phytolacca depresses the heart rate and the respiration, and is a paralyzer of motion by central action on the spinal cord. It is a slow and depressant emeto-cathartic, also somewhat narcotic and alterative.

Q.—What are its therapeutic uses?

Mastitis, varicose ulcers, eczema, chronic rheumatism, tonsillitis, diphtheritic sore throat, and chronic follicular pharyngitis.

Q.—What are the Dental uses of Phytolacca?

The tincture of Phytotacea Decandra is recommended in doses of from five to ten drops hourly in pulpitis and acute pericementitis as well as neuralgia of the head and face. (Items 4.91).

AILANTHUS—Tree of Heaven.

Q.—What is Ailanthus?

The bark of *Ailanthus glandulosa* (Nat. Ord. Simarubaceæ).

Q.—What does it contain?

An Oleo-resin and a volatile oil.

Q.—What are its preparations?

Tinctura Ailanthus (unofficial),	♏x–ʒij
Extr. Ailanthus Fluidum,	♏x–ʒj

Q.—What are its physiological actions?

Ailanthus paralyzes the cerebrum and spinal cord, a drastic purgative, with weakness, vertigo, cold sweats, headache, pain in the back, numbness and tingling of the limbs. It is a cardiac and respiratory depressant, and a tæniafuge.

Q.—What is its therapy?

Malignant scarlatina and tape-worm.

RESTORATIVE AGENTS.

Q.—What remedies are usually classed as Restorative Agents?

This division of Materia Medica includes all agents which in any way promote the constructive metamorphosis of tissue, such as digestive ferments, which aid digestion; the foods, tonics, hæmatics or blood restorers, and many substances generally known as stimulants.

Name them.

Digestive Ferments.
Phosphites.
Oils and Fats.
Arsenic.
Phosphates.
Mineral Acids.
Manganese.
Bismuth.
Lactic Acid.
Iron.
Phosphorus

Q.—What are the Digestive Ferments?

Pepsin.
Pancreatin.
Ingluvin.
Papain.
Extract of Malt.

Q.—From what kingdoms of nature are these substances derived?

Three from the animal and two from the vegetable kingdom.

Q.—What is Pepsin?

Pepsin is an organic ferment which constitutes the digestive principle of the gastric juice of animals, and is usually obtained from the stomach of the pig, sheep or calf.

Q.—What is Ingluvin?

Ingluvin is obtained from the gizzard of the domestic fowl, and owes its digestive activity to a peculiar bitter principle.

Q.—What is Pancreatin?

Q.—Pancreatin is an organic substance obtained from the pancreas of recently killed animals.

Q.—What does it contain?

Four ferments, viz.: Trypsin, Pancreatic Diastase, an emulsifying, and a milk-curdling ferment.

Q.—What is Papain?

Sometimes called Papaw or Papayotin, is a ferment obtained from the milky juice of *Carica Papaya*, a South American fruit tree. (Nat. Ord. Papayaceæ). It is too powerful a digestant to be used internally, as it might digest the gastric mucous membrane itself.

Q.—What is the Extract of Malt?

It is prepared from the seed of *Hordeum distichum* or barley. (Nat. Ord. Graminaceæ.)

Q.—What are the physiological actions of these substances?

Pepsin and Ingluvin digest the nitrogenous principles of the food (albumen, casein, fibrin, etc.,) converting them into peptones for assimilation; in this action they are materially aided by lactic and hydrochloric acids.

Pancreatin does the same, and in addition, with the aid of an alkali, it emulsifies fats and oils.

Papain digests albumen and fibrin, and dissolves false membranes, ascarides and tænia.

Extract of Malt contains diastase which aids in converting starch into dextrine and glucose.

What are the Therapeutic uses of these agents?

Pepsin in atonic dyspepsia, the apepsia of infants, gastralgia, anæmia, chlorosis, gastric ulcer and cancer, diarrhea of infants and the vomiting of pregnancy.

Ingluvin is particularly useful in vomiting, and especially the vomiting of pregnancy.

Pancreatin is used in intestinal indigestion to aid the emulsiying of fats and oils, and should be administered two or three hours after meals.

Trypsin is used with benefit as a solvent for diphtheritic membrane.

Papain is a powerful digester of fibrin, acting in solution of any reaction, and at higher temperatures than Pepsin will; it also is a rapid solvent of false membranes and of intestinal worms.

Extract of Malt is used in intestiual indigestion, also as a tonic in *debility* and in *nervous exhaustion*, and as a vehicle for cod liver oil.

Q.—What are the preparations and doses of the digestants?

Pepsinum Saccharatum,	dose gr. v–xx
Liquor Pepsini,	dose fʒj–iv
Ingluvin (not official),	dose gr. v–xv.
Papain (not official),	dose gr. j–v
Extract of Malt,	dose fʒj–iv

Q.—Are there any substances incompatible with the digestants?

Yes, Alcohol and many of the mineral salts destroy their properties. Alkaloids (when sufficiently powerful) destroy the action of pepsin and ingluvin, while materially aiding that of pancreatin. *Acids* retard and finally destroy the action of Pancreatin while aiding those of pepsin and ingluvin.

What are the Dental uses of these agents?

Pepsin has been employed in dental practice in the treatment of putrid pulps, as a digestant, an antiseptic and deodorizer, also as an application to partly decomposed dentine, and in conjunction with HCl as a paste to devitalize teeth where rapid action is not desired. Trypsin has been substituted for Pepsin by some having confidence in its more powerful action on fibrinous tissue.

Give formula containing Pepsin.

For Suppurating Pulps.

℞ Acidi Hydrochlorici,	♏j
Aquæ Destillatæ,	♏xl
Pepsini Porci,	q. s.

To make a Paste.

Signa: Apply to suppurating pulps. (OAKLEY COLES.)

ACIDUM LACTICUM—Lactic Acid.

Q.—What is Lactic Acid?

A syrupy, oily liquid, formed by the souring of milk ($C_3H_6O_3$).

What are its physiological effects?

Found as a normal ingredient of the gastric juice, it aids digestion, and promotes the appetite. In large doses it causes flatulence and much epigastric pain. It is supposed by some to be the cause of acute rheumatism, when in excess and free in the blood.

Q.—What is its therapy?

Lactic Acid is used to *diminish* the acidity of the gastric juice, or to replace the deficiency of the acid. To aid digestion and nutrition in *oxalic*, *phosphatic*, or *uric* acid diathesis; diabetes, and locally as a solvent for the false membranes of croup and diphtheria.

What are the preparations and doses of Lactic Acid?

Acidum Lacticum, 75 per cent., dose ♏v–xxx, freely diluted, and often prescribed in a mixture with pepsin.

What power is possessed by lactic acid that renders it of peculiar interest to the dentist?

Its power to dissolve calcium phosphate. Miller's experiments show that, during caries, lactic acid is formed in the teeth in sufficient amount to destroy the dentine.

MINERAL ACIDS.

Q.—Name the Mineral Acids.

Acidum Sulphuricum (H_2SO_4).
Acidum Hydrochloricum (HCl).
Acidum Nitricum (HNO_3).
Acidum Phosphoricum (H_3PO_4).

Q.—What are the preparations of the Mineral Acids and their doses?

1. Acidum Sulphuricum (*Sulphuric Acid*, *Oil of Vitriol*), contains 96 per cent. of *absolute* Sulphuric Acid, and is too strong for internal use.

Acidum Sulphuricum Dilutum (*Diluted Sulphuric Acid*) contains 10 per cent of the *official* sulphuric acid, and is used internally. Dose ♏ij–xx.

Acidum Sulphuricum Aromaticum (*Aromatic Sulphuric Acid*, *Elixir of Vitriol*); contains 20 per cent. of the official acid with alcohol, tinct. of ginger and oil of cinnamon. Dose ♏ij–xx.

2. Acidum Nitricum (*Nitric Acid*) contains nearly 70 per cent. of anhydrous acid, and is not employed internally.

Acidum Nitricum Dilutum (*Diluted Nitric Acid*) contains 10 per cent. of *absolute* nitric acid. Dose ♏ij–xx freely diluted.

3. Acidum Hydrochloricum (*Hydrochloric Acid, Muriatic Acid*) contains nearly 32 per cent. of *absolute* acid, and is not used internally.

Acidum Hydrochloricum Dilutum (*Diluted Hydrochloric Acid, Diluted Muriatic Acid*) contains 10 per cent. of the absolute acid. Dose ♏v to xx freely diluted.

4. Acidum Nitro-Hydrochloricum (*Nitro Hydrochloric Acid, Nitro-Muriatic Acid, aqua regia*) (H N O_3 4 H C l 15 parts. Dose ♏j–x freely diluted.

Acid Nitro-Hydrochloricum Dilutum (*Diluted Nitro-Hydrochloric Acid*). Dose ♏ij–xx freely diluted.

Acidum Phosphoricum (*Phosphoric Acid*) contain 50 per cent. of ortho-phosphoric acid, and is not used internally.

Acidum Phosphoricum Dilutum (*Diluted Phosphoric Acid*) contains 10 per cent. of ortho-phosphoric acid. Dose ♏v–xxx freely diluted. (An average dose of the diluted mineral acids is gtt. iij–x).

Q.—What are the general effects of the acids and alkalies upon secretions?

Law 1. Acids increase alkaline secretions.
Law 2. Acids decrease acid secretions.
Law 3. Alkalies increase acid secretions.
Law 4. Alkalies decrease alkaline secretions.

Q.—How may these laws be applied to the treatment of digestive disturbances?

1. *To decrease excessive activity of the gastric juice.*

(*a*) Give an acid before meals to decrease its secretion, or

(*b*) An alkali after meals to neutralize the acid present.

2. *To increase the acidity of the gastric juice when it is deficient in that quantity.*

(*a*) Give an alkali before meals to increase the secretion of acid, or

(*b*) An acid after meals to supply the deficiency.

Q.—What are the physiological effects of the mineral acids?

Locally the strong acids are *escharotics*, abstracting water from the tissues and combining with the bases. *Sulphuric* and *Phosphoric* acids penetrate the tissues more deeply than the others. *Sulphuric* produces a *black*, while *Nitric* acid causes a *yellow* eschar.

Internally, in a diluted state and in medicinal doses, they increase the *appetite, digestion* and *nutrition* (*hydro-*

chloric and *phosphoric* being more pronounced in their effects). If taken for some time continuously, they diminish the acid of the gastric juice and disorder digestion (sulphuric acid more quickly than the other). Sulphuric acid possesses an astringent influence over the secretions of the skin and bowels; Nitric acid on the contrary, appears to increase the alimentary secretions and that of the liver.

They are eliminated by the secretions of the kidneys, bowels and skin. In *large doses* they act as irritant corrosive poisons.

Q.—How should poisoning by the mineral acids be treated?

1. Give alkalies or alkaline earths (tooth powder or soap may be used) to neutralize the acid.

2. Give eggs, milk and other demulcents to protect the surface.

3. Give opium and nutritive and stimulating enemas, or intra-venous injections of ammonia, to counteract the resulting depression.

4. As stricture of the œsophagus often follows in these cases if they survive, the passage of an œsophageal bougie should be practiced within three or four months after the poisoning.

Q.—What are the therapeutic uses of the Mineral Acids?

For their effects on digestion and nutrition: To prevent excessive formation of acid (both where too much is secreted and where it is formed by fermentation of the food), diluted hydrochloric or phosphoric acid is given before meals, or in *atonic dyspepsia and indigestion* due to deficient acid, they may be taken after meals (often combined with pepsin.) In fevers they are used to aid digestion and secretion generally, and allay thirst (by stimulating the secretion of the mouth and fauces, thus keeping these parts moist.)

2. *For their effect on secretion:* Diluted nitric or nitro-hydrochloric acid is used internally to increase the secretion, and as a bath (f℥iij to water Cj), in chronic

hepatic congestions and inflammation, in malarial and catarrhal jaundice, and in duodenal catarrh; as an astringent in diarrheas, dysentery and cholera, diluted sulphuric acid is given combined with opium, and to arrest profuse sweating diluted or aromatic sulphuric acid may be temporarily employed.

3. As a *hæmostatic* the same agent is often used in uterine or intestinal hemorrhages and occasionally in puerpura.

4. As a treatment of, or as a preventive to lead poisoning, diluted sulphuric acid is administered (forming an insoluble lead sulphate.)

5. Locally as an escharotic, fuming nitric acid may be applied to chancroids, phagedenic ulcers, hospital gangrene, gangrene in wounds. It is also used to remove warts, and as an intra-uterine application in various forms of endometritis, as a stimulating lotion to unhealthy granulations, and to check bleeding from hemorrhoids, in weak solutions.

Q.—How are the mineral acids employed in Dental practice?

Sulphuric acid is used in the dental laboratory for cleaning metallic plates preparatory to and after soldering, its action being more vigorous when diluted with water about one-third. Its action on hemp paper is to reduce it to pyroxylin, hence it is used in the preparation of celluloid base.

Therapeutically it is applied in concentrated form as a caustic in malignant ulcers, cancrum oris, gangrene, etc., by making it into a paste with powdered sulphate of zinc. In dilution it is used as a local application to various affections of the mouth, also the aromatic sulphuric acid which is similar in its action to the diluted form, and is more agreeable for use about the mouth.

It is a valuable application in pyorrhœa alveolaris, in caries and necrosis of the maxillary bones, as an injection or lotion, as it stimulates the parts to healthy action by favoring granulation. It may also be applied to the gingivæ in cases of recession of the gums and absorption of the processess, and is valuable as an injection in sluggish alveolar abscesses in combination with a few drops of tincture of capsicum. It has the power of dissolving the thin, carious portions of bones, such as the margins of the alveolar cavities, and can be applied on cotton saturated with it and permitted to remain for several hours, when the parts should be cleansed with warm water. It is also employed as a gargle, properly diluted, in mercurial inflammation of the mouth and other forms of stomatitis, which do not yield to the influence of milder astringent washes, and in the treatment of apthæ and other ulcers of the oral cavity.

Q.—For what purpose is Nitric acid employed in dentistry?

Principally in combination with HCl as a solvent for gold.

Q.—In what proportions are these agents used, and what is the combination called?

Acidum Nitro-hydrochloricum (Nitro-Muriatic Acid Aqua Regia), and the proportions are nitric acid four parts, hydrochloric acid fifteen parts.

Q.—For what other purpose in dentistry is nitric acid used?

It is sometimes used to dissolve zinc oxide in the preparation of oxphosphate cement, also used as a caustic, both alone and in conjunction with a silver wire.

Q.—What precaution should be observed in the use of these agents?

As they are powerful, care should be used that they come in contact only with the tissue for which they are intended.

Q.—For what purposes is HCl sometimes used?

As a solvent for zinc (in the laboratory), locally as an application to malignant ulcerations of the mouth and throat, and internally as an aid to digestion.

Q.—For what purposes is Phosphoric Acid sometimes used?

Glacial phosphoric acid, properly prepared, forms the liquid portion of oxyphosphate cement. The diluted phosphoric acid is used as a local application in caries and osseous tumors of the jaws, and has been administered internally with the view of supplying a deficiency of phosphates in the teeth.

Q.—What precautions are observed in regard to preparations of phosphoric acid?

They are liable to fungoid growth of a tenacious or mucoid character, diffusible, and of a yellowish gray color; it loses strength on development of this growth, its sp. gr. falling often below 1.055.

Q.—How is phosphoric acid usually administered internally?

In the form of phosphates, phosphites or hypophosphites.

Give formula containing the mineral acids.

For Mercurial and Ulcerative Stomatitis.

℞	Acidi Sulphurici,	♏x
	Decocti Hordei,	f℥iv
	Mellis,	f℥ss

M. Signa: Use as a gargle.

For Apthæ and other Ulcers of Mucous Membranes and Gums.

℞	Acidi Sulphurici,	f℥ss
	Mellis,	f℥j

M. Signa: To be applied with a camel's-hair brush.

For Carious Bone, Rigg's Disease, etc.

℞	Acidi Sulphurici Aromat,	fʒiij
	Tincturæ Capsici,	gtt. x
	Aquæ,	fʒij

M. Signa: Use as an injection or lotion.

For Sloughing and Ill Conditioned Ulcers.

℞	Acidi Nitrici,	♏lx
	Aquæ,	Oj

M. Signa: Apply with camel's-hair brush.

For Apthæ.

℞	Acidi Hydrochlorici,	1 part
	Mellis,	8 parts

M. Signa: Apply with camel's-hair pencil.

For Chronic Inflammation of Mucous Membranes and Gums.

℞	Acidi Hydrochlorici Diluti,	♏x
	Infusi Cinchonæ,	f℥iv
	Mellis,	f℥j

M. Signa: Use as a gargle.

For Ulceration of Mucous Membrane.

℞	Acidi Hydrochlorici Diluti.	ʒij
	Glycerini,	ʒiv
	Aquæ Dest.,	℥x

M. Signa: Use as a gargle.

For Ulcers over Carious Bones.

℞	Acidi Phosphorici Glacialis,	ʒj
	Aquæ Dest.,	f℥viij

Fiat Solutio,

M. Signa: To be applied on compresses to ulcers situated over carious bones.

For Caries of the Maxillary Bones and for Osseous Tumors of the Jaws.

℞	Acidi Phosphorici Diluti,	1 part
	Aquæ Dest.,	8 to 10 parts

M. Signa: Apply as a lotion or injection.

Fletcher's Oxyphosphate of Zinc Cement.

Fluid:
  Phosphoric Acid,
  Phosphate of Aluminum.
Solid:
  Basic Oxide of Zinc.

Weston's Oxyphosphate of Zinc Cement.

Fluid:
  Phosphoric Acid.
Solid:
  Basic Oxide of Zinc, 80 per cent.,
  Silicate of Aluminum, 20 per cent.

OILS AND FATS.

Name the fixed Oils and Fats used in medicine.

Adeps, *Lard.*
Sevum, *Suet.*
Oleum Olivæ, *Olive Oil.*
Ol. Amygdalæ Expressum, *Almond Oil.*
Oleum Adipis, *Lard Oil.*
Cetaceum, *Spermaceti.*
Oleum Sesami, *Benne Oil.*
Oleum Theobromæ, *Cacao-butter.*
Oleum Lini, *Flaxseed, or Linseed Oil.*
Oleum Morrhuæ, *Cod-liver Oil.*
Oleum Gossypii Seminis, *Cotton Seed Oil.*
Oleum Ricini, *Castor Oil.*
Oleum Tiglii, *Croton Oil.*
Lanolinum, *Lanolin or Sheep's Wool Fat.*

Q.—How do the Fixed Oils differ from the Volatile or Essential Oils?

The Fixed Oils are composed of carbon, hydrogen and oxygen, while the volatile or essential oils are composed of carbon and hydrogen only.

Q.—Of what are the oils principally composed?

All the oils (except cod-liver oil) contain olein, stearin, and margarin, in varying proportions, the olein giving fluidity, the stearin solidity.

Q.—How does Cod-liver oil differ from the other oils?

Cod-liver oil consists chiefly of olein and margarin, with a peculiar principle, *Gaduin*, and yields by distillation with ammonia, *Propylamin.* It also contains various biliary principles and traces of iodine, bromine, phosphorous, sulphuric and phosphoric acids, lime, magnesia, soda, and iron.

Q.—How many varieties of Cod-liver oil are sold?

Three; the pale, light brown, and the dark. The pale is the purest, and is the official oil.

Q.—How does Linseed oil differ from the other oils?

It contains much vegetable albumen which coagulates on exposure to air, making it a drying oil.

Q.—How does Lanolin differ from the other oils?

In resisting saponification, the action of water, and the tendency to rancidity. It is perfecly neutral as a base, and readily penetrates the integument, carrying with it any medicament with which it is charged.

Q.—What are the physiological actions of the oils and fats?

Fats in small quantities are necessary to the digestion of nitrogenous food, and form the molecular basis of chyle. They are prepared for absorption by the pancreatic juice and the bile, especially the latter. Fat is an essential constituent of the products of tissue formation, whether physiological or pathological, and is the chief material concerned in the formation of force. After oxidation it is excreted as carbonic acid and water. Locally applied fat reduces the body temperature.

Q.—What is the therapeutic value of the oils and fats?

Locally, by inunction, oils and fats may be used in the scaly disease of the skin, and in chronic wasting diseases; also in sickly and scrofulous children, and in febrile disorders, particularly the desquamative stage of scarlatina. Cod-liver oil is used also in chronic forms of phthisis, bronchitis, rheumatic disorders, atheroma of the arteries, struma, skin diseases, syphilodermata, neuralgia, chorea, epilepsy, and diarrheas of strumous subjects. Castor oil is laxative while croton oil is a drastic purgative.

Q.—What oils are of Dental value, and how?

Almond oil forms a pleasant and soothing application for excoriations of the lips and inflamed mucous membranes; also for the small, simple, but painful ulcers which sometime appear upon the gums, mucous membrane of the cheeks, and the tongue. Lanolin is an efficient ingredient of "nerve paste," increasing its power of absorption. Olive oil, cotton-seed oil, etc., are also serviceable to the dentist as antagonistic applications to surfaces, accidentally brought in contact with escharotic substances.

PHOSPHORUS.—P.

Q.—What is Phosphorous?

Phosphorous, is a non-metallic element obtained from bones. It is also found in a state of combination in the unstratified rocks, the soil, the organism of plants, and the bodies of animals.

Q—What are the physiological properties of Phosphorous?

Phosphorous is a translucent, nearly colorless solid, of waxy lustre, and usually the consistence of bees wax; soluble in 50 parts of any fatty oil, in 80 of absolute ether, 350 of absolute alcohol and freely in carbon bi-sulphide. It has a disagreeable odor and taste, melts at 111 F, is luminous in the dark, ignites in the air, and should be kept under water in a cool place, protected from the light.

Q.—How is Phosphorus usually administered?

As Phosphites and Phosphates.

Q.—What are the preparations of Phosphorus?

OF PHOSPHORUS.

Pilulæ Phosphori, *Pills of Phosphorus*, each contains gr. $\frac{1}{100}$,	dose j to v
Oleum Phosphoratum, *Phosphorated Oil*, strength $\frac{1}{100}$,	dose ♏j to v
Acidum Phosphoricum, *Phosphoric Acid*, strength 50 per cent. (see mineral acids).	
Tinctura Phosphori (Thompson's) (unofficial) each ʒ contains gr. $\frac{1}{33}$.	
Tinctura Phosphori (Bellevue Hos.) (unofficial) each ʒ contains gr. $\frac{1}{12}$.	
Zinci Phosphidum, *Phosphide of Zinc*, very irritant,	dose $\frac{1}{50}$ to $\frac{1}{20}$

OF PHOSPHITES.

Calcii Hypophosphis, *Hypophosphite of Calcium*,	dose gr. x–xxx
Ferri Hypophosphis, *Ferric Hypophosphite*,	dose gr. v–x
Potassii Hypophosphis,	dose gr. v–x
Sodii Hypophosphis,	dose gr. v–x
Syrupus Hypophosphitum, *Syrup of Hypophosphites*,	dose ʒj–℥j
Syrupus Hypophosphitum cum Ferro, *Syrup of Hypophosphites with Iron*,	dose ʒj–℥j

OF PHOSPHATES.

Calcii Phosphus Præcipitatus, *Precipitated Phosphate of Calcium*,	dose gr. ij–x
Syrupus Calcii Lactophosphatis,	dose ʒj–℥j
Sodii Phosphas,	dose ʒj–℥j
Syrupus Ferri, Quininæ et Strychninæ Phosphatum,	dose ʒj–ij
Syrupus Phosphatum Compositus, *Compound Syrup of Phosphates*,	dose ʒj–ij
Ammonii Phosphas,	dose gr. v–xx
Ferri Phosphas,	dose gr. v–x
Ferri Pyrophosphas,	dose gr. ij–v

Q.—What are the physiological actions of Phosphorus?

In small doses it is a stimulant to the growth of bones, to the genital function and to the brain, circulation and stomach. It aids digestion by irritating the end organs of the stomach nerves, and causes eructations of phosphide of hydrogen. Its fumes cause necrosis of the superior or inferior maxillary bones, especially in those whose teeth are decayed, but this may be prevented by inhalation of the fumes of old acid turpentine. *In poisonous doses* it is a powerful gastro-intestinal irritant. Reaching the blood as Phosphorus, it destroys the red blood corpuscles, causing acute hemorrhage from fatty degeneration of the arterial walls, rapid steatosis of the stomach, liver and heart, with deep jaundice; then delirium, convulsions, coma and death, generally from failure of both respiration and circulation.

Q.—What is the treatment for acute Phosphorus poisoning?

1. Give *Cupric Sulphate* gr. v at once as an emetic and as an antidote.

2. Give *Hydrated Magnesia* as a purgative. Lime water or charcoal to prevent its action on the tissues.

The antidote is Oil of Turpentine. No oils or fats (except turpentine) should be used as they dissolve P. and promote absorption.

Q.—What are the therapeutic uses of Phosphorus?

Phosphorus is used as a tonic to promote nutrition. (1) In various nervous affections associated with anæmia, as *cerebral exhaustion*, *locomotor ataxia*, *paralysis agitans*, and the various *neuralgiæ*. (2) In general disease, as *osteomalacia*, *rickets and pernicious anæmia*. (3) In *functional impotence*, and (4) as a substitute for arsenic in certain skin diseases, as *lupus and psoriasis*. The phosphates, etc., and hypophosphites, are used as alteratives and nutrients in diseases of malnutrition, especially when these salts are wanting in the system, as in *rickets*, mollities ossium, caries and necrosis, delayed union of fractures, superlactation, prolonged suppuration, anæmia, chronic diarrhea and chronic phthisis.

Q.—What medicines are incompatible with Phosphorus?

Hydrated magnesia, lime water, cupric sulphate, powdered charcoal and oil of turpentine are chemically imcompatible with it.

Q.—What substances aid its absorption?

Oils and Fats.

Q.—What precaution should be observed in prescribing Phosphorus?

Great care should be taken, especially when large doses are prescribed, that the remedy be not administered for a long period continuously for fear of causing fatty degeneration of the viscera.

Q.—What are the Dental uses of Phosphorus and its combinations?

Phosphorus is of value as a deoxidizer in fusing refractory metals, such as iridium, nickel, etc. Phosphoric acid (see mineral acids.) As the phosphates are ingredients of most of the mineral and vegetable foods, and as Phosphorus forms the mineral basis of the bones and teeth, it is obvious that it is indicated in all diseases in which defective development of these structures exist. It appears also to be of value in all the affections characterized by malnutrition. The hypophosphites fulfil nearly all the indications of phosphorus itself.

FERRUM—Iron.—Fe.

Q.—What is Iron?

A metallic element, Fe.

Q.—What is the source of Iron?

Metallic Iron, in a more or less pure state, is occasionally met with in nature, but is chiefly found distributed as oxide, sulphide, carbonate, phosphate, etc.

Q.—What is Ferrum Reductum?

Reduced Iron, or metallic iron in fine powder, obtained by reducing the sesquioxide of hydrogen at a dull red heat; odorless, tasteless, insoluble in water or alcohol, but soluble in diluted sulphuric acid, with the evolution of nearly ordorless hydrogen gas. Dose gr. j-v after meals.

Q.—What are the chief compounds of Iron, their preparations and doses?

Ferri Chloridum, *Per-chloride of Iron*, strongly astringent and hæmostatic; never used internally.

Liquor Ferri Chloridi, an aqueous solution of the preceding, containing 37.8 per cent. of the anhydrous salt, and some free HCl. Action, strongly astringent and styptic. Rarely used internally. Dose ♏j–v well diluted.

Tinctura Ferri Chloridi, has of the preceding 35 parts, alcohol 65 parts; action, ferruguious tonic. Dose ♏v–xx in water, syrup or glycerin.

Ferri Oxidum Hydratum, *Hydrated Oxide of Iron.* Should be freshly prepared from the solution of Tersulphate of Iron 10 parts, and water of ammonia 8 parts. Dose a teaspoonful in water, frequently repeated.

Ferri Oxidum Hydratum Cum Magnesia, a mixture of

Sol. Tersulphate of Iron,	gr. 1000
Water,	gr. 2000
with	
Magnesia,	gr. 150
Water,	℥xxxij

It is a more convenient and a more efficient antidote for arsenic than the simple ferric hydrate, as the excess of the alkaline precipitant is more irritant, and is itself an antidote to arsenic. Dose ℥ss or more.

Ferri Sulphas (*Ferrous Sulphate, Green Vitrol of Copperas*), one of the most active and astringent preparations of Iron. It is irritant to the stomach and poisonous in over doses, used also in solution to disinfect privies and drains. Dose gr. ss–ij in pill.

Liquor Ferri Sub-sulphatis (*Per-sulphate, or Monsel's Solution*), chiefly used locally as a styptic.

Ferri et Ammonii Sulphas (*Iron and Ammonium Sulphate*). Locally as a styptic, and internally as an astringent in chronic diarrhea and dysentery. Dose gr. j–v.

Ferri Dialysatum, *Dialysed Iron* (unofficial), a 10 per cent. solution of ferric oxychloride in water. Dose ♏x–xxx.

(About fifty different preparations of Iron and its compounds, official and unofficial, are mentioned by different authors, for a study of which students are referred to the larger text-books. The above have been considered sufficient for the needs of the present volume.)

Q.—What medicines are incompatible with the Iron preparations?

1. The alkaline preparations of Iron are incompatible with the acids and acidulous salts.

2. The salts formed by mineral acids with Iron, with alkalies and alkaline earths and their carbonates.

3. The iodides, bromides and salts containing vegetable acids, with the alkalies and alkaline earths and their carbonates, and with acids and other acidulous salts.

4. All the Iron preparations, with substances containing tannic or gallic acids, hence they cannot be prescribed with any of the vegetable tonics, except the simple bitters.

Q.—When and how should Iron be administered?

At, or immediately after meals. The fluid preparations freely diluted, and the teeth protected. It is important to overcome their astringent effects by occasional laxatives.

Q.—What are the physiological effects of Iron?

Metallic Iron is inert. In the stomach it is dissolved and forms salts, probably entering the blood as an albuminate. In the intestines it is converted into a sulphide and colors the stools black. Normally Iron exists in the blood in the proportions of 1 of Iron to 230 of red corpuscles; when deficient in the blood, under a course of Iron the number of corpuscles increase, the blood is improved in quality, and consequently the tissues are better nourished, and all the functions of the body are better performed. In appropriate cases it promotes the appetite and digestion by stimulating the gastric glands, but if given for too long a time it disorders digestion. The sulphates, nitrates and chlorides of iron are astringent, diminishing the secretions of the mucous membranes, thus causing constipation and coagulating albumen, thus proving hæmostatic. Is eliminated with the fæces, bile and urine. The tincture of the chloride is diuretic.

Q.—What are the therapeutic uses of Iron?

1. As a general tonic to improve the appetite and digestion when it should be combined with a purgative.

2. To improve the condition of the blood and aid nutrition in anæmia and chlorosis; in malarial anæmia (with quinine) in various cachexiæ, as the scrofulous, strumous and syphilitic (with iodides); in amenorrhœa, dysmenorrhœa or menorrhagia associated with anæmia; in fatty degeneration and in dilatation of the heart; in many forms of neuralgia and in many nervous affections associated with anæmia, as epilepsy or chorea; in convalescence from acute diseases, and after exhausting hemorrhages. in erysipelas iron is almost a specific (tinct. chloride ♏xx–xxx every two or three hours) and in diphtheria it is useful.

3. As an astringent it is used internally in chronic diarrhea and dysentery. In chronic albuminuria it is useful both as a tonic and astringent.

4. As a hæmostatic in all passive hemorrhages in the anæmic (tinct. of the chloride), and in hemorrhages from the lungs, stomach, bowels or kidneys (sub-sulphate, ter-sulphate or nitrate in drop doses, largely diluted and frequently repeated.)

5. Locally it is employed as a styptic (sub-sulphate, ferri et ammonii sulphas), etc.

In arsenical poisoning the hydrated oxide is considered the best antidote, forming with arsenious acid an almost insoluble compound.

Q.—In the administration of Iron (per orem) what precautions are suggested, by Gorgas, as a protection to the teeth.

The use of an alkaline gargle of carbonate of soda, or prepared chalk, or a solution of ammonia, before and after taking, and the subsequent employment of an antacid dentifrice. The use of a tube carried well back in the mouth is also suggested as a medium of introduction.

Q.—Upon what hypothesis are the above precautions built?

That owing to the acidity and astringent property of many of these preparations, injury results from their energetic action; also, while the carbonate of iron, in pill, nor reduced iron are injurious to the teeth by direct action, yet eructations of hydrogen compounds produced by their injection may prove injurious.

Q.—What are the Dental uses of Iron and its preparations?

In its metallic state iron and steel are indispensible to the dentist as material for instruments, tools and appliances. Therapeutically the preparations of Iron and its compounds are valuable as tonics, astringents, styptics, etc., and as an antidote to arsenical poisoning. The Tinct. Ferri Chloridum is useful in neuralgias accompanied by anæmia, and also in subjects of hæmophillia, or hemorrhagic diathesis, and as a local styptic. Monsel's solution is also employed in hemorrhage following tooth extraction, leech bites, and from all other causes whether traumatic or idiopathic. Dialyzed Iron is used also as a tonic and as an antidote to arsenic in contact with mucous tissues.

Q.—What precautions are necessary in applying Monsel's solution to the alveolus?

It is liable to cause a sloughing of the bleeding tissues, thereby producing secondary hemorrhage, and should therefore be used in weak solution and carefully watched. Alum Iron, or Ferri et Ammonii Sulphas, is also used for the same purpose and is much preferred by some practitioners. It may be used either in powder or solution, with the same precautions.

Q.—Give formula for styptic.

For Hemorrhage after extraction.

℞ Liq. Ferri Per-Sulph.
Sodium Chlor. āā parts æquales.

M. Signa: Apply on cotton to bleeding cavity and secure by covering with cotton, cloth, or modelling compound.

MANGANUM—Manganese.

Q.—What are the sources of Manganese?

Manganese is obtained from the native (impure) black oxide, and also from the Carbonate, and is represented in the Pharmacopœa by two of its salts, the black oxide and the sulphate.

Q.—What are the preparations of Manganese?

Mangani Oxidum Nigrum, *Black Oxide of Manganese*,	dose gr. j–x in pill, powder or capsule.
Mangani Sulphas, *Sulphate of Manganese*,	dose gr. j–v
Potassii Permanganas, *Permanganate of Potassium*	dose gr. ss–ij in water, capsule or (pill with kaolin).

(There are two unofficial preparations).

Q.—What are the physiological actions of Manganese?

Manganese exists normally in the blood, hair, bile, etc. Associated with iron the proportions to iron in the red corpuscles being as 1 to 20. Given internally it improves the appetite, digestion and nutrition, in larger doses it decreases the heart's action and lowers the blood pressure; if large doses are given for some time, the effects resemble those of zinc (wasting and feebleness, staggering gait, and finally paraplegia). In toxic doses it is a gastro-intestinal irritant. The sulphate is an emeto-cathartic and cholagogue. Potassium permanganate is a powerful oxidizing agent, and hence an antiseptic. It increases the menstrual flow.

Q.—For what medicinal purposes is Manganese used?

To improve the condition of the blood in anæmia, etc., either combined with iron or as a substitute for it; to improve the appetite and digestion; as a cholagogue (sulphate); as an antidote to snake bites (potas. perman., internally and locally; in amenorrhœa, and locally in scarlatina, diphtheria, cancerous and other ulcers, abscesses, otorrhœa, etc. (potas. perman.)

Q.—What medicines are incompatible with Manganese?

The salts of lead, silver, and mercury; and the caustic alkalies are chemically incompatible.

Q.—What are its Dental uses?

The permanganate of potassium is of special interest to the dentist, being a powerful disinfectant. It is employed in the treatment of fetid and gangrenous ulcerations of the mouth, fetid breath, etc.; as an antiseptic for decomposing pulps of teeth (grs. ij to water ℥j); in abscesses, caries, necrosis, pyorrhœa alveolaris, etc. (grs. x to water ℥j). The powdered crystals introduced into a carious cavity will relieve odontalgia. The stains may be removed by dilute hydrochloric acid.

Give formulæ for the Dental use of Permanganate of Potassium.

For Unhealthy Ulcers of the Mouth, and Offensive Breath.

℞	Potas. perman.,	℈j to iv
	Aquæ dest.,	Oj
M.	Signa: To be used as a gargle.	

For Ulcers, Abscesses, Decomposing Pulps, etc.

℞	Liq. potas. perman.,	ʒj
	Aquæ dest.,	℥vi to x
M.	Signa: To be used as a gargle or as an injection.	

For a Disinfectant in Mercurial Stomatis.

℞	Potas. perman.,	gr. xv
	Aquæ,	f℥viij
M.	Signa: To be used as a gargle.	(GORGAS.)

BISMUTHUM—Bismuth.

Q.—What is Bismuth?

A yellowish-white metal, found generally native or in the metallic state.

Q.—What are the preparations of Bismuth?

Bismuthi Subcarbonas,	dose gr. x–ʒj
Bismuthi Subnitras,	dose gr. x–ʒj
Bismuthi et Ammonii Citras,	dose gr. ij–iv
Bismuthi Subiodidum (unofficial.)	

Q.—What is the physiological action of the salts of Bismuth?

Chiefly that of local sedatives and astringents. Though a minute quantity passes into the blood, where it acts as a tonic, promoting the constructive metamorphosis by stimulating the appetite and digestion.

Q.—To what agent is the toxic effect of Bismuth due?

To the presence of arsenic, with which most of the commercial preparations are contaminated.

Q.—What properties are possessed by the subiodide?

It has an energetic antiseptic and stimulant action upon wounds, ulcers, etc., promoting the growth of granulation tissue, and preventing the formation of pus.

Q.—What is the therapy of the salts of Bismuth?

Internally in most forms of disordered digestion, vomiting and diarrhea. Locally as a dressing to wounds, ulcers, etc.

Q.—What are the Dental uses of Bismuth and its salts?

The metal is useful in alloys owing to its low melting point, and to the fact that it expands very considerably as it solidifies. The sub-nitrate is valuable as an internal remedy in apthæ, mercurial salivation, painful ulcers of the mucous membrane of the mouth, vomiting, cholera infantum and the diarrhea of children during painful dentition. It is best given in milk, and before meals. For cancrum oris, after using a disinfecting solution to cleanse the gangrenous part, the topical application of sub-nitrate of bismuth every three hours, corrects the fetor, arrests the progress of the gangrene, and hastens cicatrization. (GORGAS.)

Give formulæ for the dental exhibition of salts of Bismuth.

For Vomiting and Painful Digestion of Teething Children, Acidity and Pyrosis.

℞	Bismuthi subnitrat,	ʒiij
	Acidi Carbol.	gr. ij–iv
	Mucil. Acaciæ,	℥j
	Aquæ menthæ pip.	℥iij

M. Signa: A tablespoonful for adults, and proportionate quantity for children, three or four times a day. (BARTHOLOW.)

For Cancrum Oris.

℞ Bismuthi subnitrat (pulv.)

M. Signa: Applied to ulcerated surface, and cover with absorbent cotton. (GORGAS.)

For Diarrhea of Dentition.

℞	Bismuthi Subnitrat,	gr. lx
	Ex. Rhei fluid,	gtt. viij
	Syrupi Rubi,	f℥ss
	Elixir Aurantii,	f℥ss

M. Signa: A teaspoonful four or six times a day. Proper food, barley water, milk and lime water. Starchy food prohibited.

(GORGAS.)

ARSENIUM—Arsenic.

Q.—What is Arsenic?

A metallic element found in nature, generally in union with sulphates, or with other metals, or with oxygen, etc.

Q.—Is metallic Arsenic used in medicine or dentistry?

No. One of its compounds, Arsenious oxide or anhydride, is of importance, and the term *Arsenic* is usually applied to this substance.

Give the synonyms for Arsenious Oxide.

Arsenious Acid, Arsenious Anhydride, White Arsenic, Ratsbane, White Oxide of Arsenic, Oxidum Arseniosum, official name *Acidum Arseniosum*.

Q.—How is Arsenious Oxide obtained?

It occurs in nature; it is formed by burning Arsenic in the air, but is obtained by roasting arsenical pyrites, ores of tin, cobalt, etc., which contain arsenic, in a furnace supplied with air, and condensing it.

Q.—What are the physical properties of Arsenious Oxide?

It crystallizes in octohedra, but is usually found as a white, gritty powder. The two conditions exist according to the degree of temperature at which condensation takes place. The vitreous is slightly more soluble than the opaque. One part dissolves in twelve parts of hot, and thirty parts of cold water, but no definite hydrate exists. It is insoluble in alcohol and ether, soluble in hot HCl, in solution of alkalies, and of tartaric acid.

Q.—What are the official preparations of Arsenic?

Acidum Arseniosum,	dose gr. $\frac{1}{50}$–$\frac{1}{10}$
Liquor Acidi Arseniosi, $\frac{1}{100}$,	dose ♏ij–x
Liquor Potassii Arsenitis (*Fowler's Solution*, $\frac{1}{100}$, gr. iv–f℥j)	dose ♏ij–x
Sodii Arsenias,	dose gr. $\frac{1}{24}$–$\frac{1}{12}$
Liquor Sodii Arseniatis,	♏ij–xv
Arsenii Iodidum,	gr. $\frac{1}{20}$–$\frac{1}{8}$
Liquor Arsenii et Hydrargyri Iodidi, (*Donovan's Solution*, 1 per cent.)	dose ♏ij–x

Q.—At what time should Arsenic usually be administered?

After meals.

Q.—What is the antidote to Arsenic?

The hydrated oxide of Iron.

Q.—How should a case of Arsenical poisoning be treated?

First, prompt evacuation of the stomach. Then, administration of the antidote, freshly precipitated and in quantity, 8 parts for 1 of the poison. Then oil, milk, or mucilaginous drinks to protect the mucous membrane; and diluents, alkaline mineral waters, iodide of potassium, etc., to promote elimination.

Q.—How may the hydrated oxide of iron be prepared?

Ten troy ounces of solution of tersulphate of Iron, diluted with 100 parts of cold water is added to eight troy ounces of aqua ammonia previously diluted with 20 parts of cold water, constantly stirred, and the precipitate washed and added to 20 parts of cold water.

Q.—How may the same preparation be extemporaneously formed?

By adding carbonate of sodium to tincture of the chloride of iron, or calcined magnesia to Monsel's solution.

Q.—What are the physiological actions of Arsenic?

Arsenic is a very painful escharotic, exciting inflammation. Internally it is a powerful irritant to the gastro-intestinal and bronchial mucous membranes. In small doses it is a stomachic tonic, promoting the appetite and digestion; increases cardiac action, respiratory, power and the secretions of the intestinal tube; stimulates the mind, the sexual appetite and intestinal peristalsis; causes rotundity of form and a fair skin. When tolerance is established, large doses are taken with impunity. Continued full medicinal doses irritate the mucous membranes, disorder digestion, give rise to epigastric pain, nausea and vomiting, diarrhea, tenesmus and perhaps dysentery, palpitation, oppressed breathing, œdema of the eyelids, albuminuria, cutaneous eruption, disordered sensation. In toxic doses the phenomena may be either gastro-intestinal or profoundly cerebral in character.

Q.—What are the gastro-intestinal symptoms of arsenical poisoning?

Burning pain in the stomach extending over the abdomen, vomiting, thirst, bloody stools, strangury. suppressed or bloody urine, a rapid and feeble heart, albuminuria and collapse.

Q.—What are the symptoms in the nervous forms?

Profound coma, like that of opium narcosis, coming on suddenly, without gastro-intestinal symptoms.

Q.—What is the therapy of Arsenic?

Arsenic is given internally in dyspepsia, gastric catarrh and gastralgia, gastric ulcer and cancer; in chronic diarrhea and dysentery, in chlorosis and anæmia, acute coryza and hay-fever; in the form of cigarettes for asthma, emphysema and chronic bronchitis, shortness of breath, neuralgia and hemicrania; paralysis agitans and chorea; in skin diseases of long standing; in the treatment of chronic malaria and in cancer. Externally it is used as an escharotic in the form of paste to destroy cancerous growths, as a hypodermatic injection in local chorea, and as an application in dental practice.

Q.—What are the usual tests for Arsenic?

When in powder, if heated with charcoal in a small test tube it sublimes and condenses in the form of a brilliant steel gray ring of minute octohedral crystals, soluble in sodium or calcium hypochlorite. When in solution, the addition of sulphuretted hydrogen or ammonium sulphide produces a lemon yellow arsenic trisulphide, insoluble in dilute hydrochloric acid, but soluble in a solution of ammonium carbonate; also the addition of ammonia water followed by a solution of silver nitrate, gives a canary yellow silver arsenite. Marsh's test and Reinsch's test should also be used.

Q.—What is Marsh's test?

It consists in the action upon the acid of nascent hydrogen, obtained by dissolving zinc in dilute sulphuric acid; the arsenious acid is deoxidized, with evolution of arseniuretted hydrogen gas.

(THOMAS.)

Q.—What is Reinsch's test?

It consists in adding a few drops of HCl to the suspected solution, and immersing in it a polished plate of copper; the solution being heated, metallic arsenic is deposited upon the copper.

(SHOEMAKER.)

Q.—What are the Dental uses of Arsenic?

Owing to the fact that the devitalizing power of Arsenious acid is greater than its escharotic power, it has been employed for years to destroy the vitality of pulps of teeth combined with other agents. It has also been employed as an obtunding agent.

Q.—Why is the use of Arsenic as an obtunding agent objectionable?

It is capable of being absorbed through a considerable thickness of dentine, and should such be the case, death of the pulp would result.

Q.—With what other agents is Arsenic combined for devitalization?

The salts of morphina, creasote, carbolic acid, iodoform, etc.

Q.—Why is it dangerous to apply Arsenic to the pulps of deciduous teeth or the teeth of young persons?

The foramen being large the danger of absorption is great, also the inability to control the patient.

Q.—What quantity of Arsenic should be employed to devitalize a pulp?

From $\frac{1}{100}$ to $\frac{1}{25}$ of a grain, according to the structure and class of the tooth.

Q.—How long should Arsenic be allowed to remain in the cavity?

From eight hours to two days, according to structure, class, etc., though it is often left in longer without bad results.

Q—What precautions are necessary in making an application of Arsenic?

To thoroughly protect surrounding tissues from its action.

Q.—Should the surrounding tissues be attacked, what agent would prove an antidote?

Dialysed iron.

Q.—How does Arsenic destroy the vitality of a pulp?

Three theories are extant, none of which have been proven or generally accepted.

Q.—What are these three theories?

Irritation, strangulation and thrombosis.

Q.—What other agent is sometimes used as a substitute for Arsenious Acid in devitalization?

Cobalt, a metal found in combination with Arsenic, and to which it owes its efficiency in dental practice.

Give formulæ containing Arsenious Acid.

For Devitalizing Pulps of Teeth.

℞ Acidi Arseniosi,
Morphinæ Acetatis, āā gr. x
Creasoti (pure wood), q. s. ut. ft. pasta
M. Signa: To remain 24 hours for adults. (GARRETSON.)

℞ Acidi Arseniosi,
Cocaini Hydrochloratis, āā gr. xx
Mentholis Crys. gr. v
Glycerini, q. s. ut. ft. pasta,
M. Signa: Use the desired quantity, and secure it with a lead cap covered with gutta-percha. (KIRK.)

℞ Acidi Arseniosi, 1 part
Cocaini Hydrochloratis, 4 parts
Lanolini, 5 parts
M. Signa: To remain 24 hours. (KIRK.)

Acidi Arseniosi,
Cocaini Hydrobromatis,
Iodoformi, āā gr. xx
Vol. Ex. Eucalypti (*Sanders*)
Creasoti (pure wood), āā q. s. ut. ft. pasta
M. Signa: To remain 24 hours.

Devitalizing Fibre.

℞ Absorbent Cotton (*Cross-cut fine*)
Arsenious Acid, gr. v
Tannic Acid, gr. ij
Acetate of Morphine, gr. x
Oily Carbolic Acid, q. s. for a paste

Reduce the cotton by cutting and cross-cutting to a soft fine fuzz, then incorporate it with the above mixture, dry, and separate into small pieces for convenient application. (GORGAS.)

BITTERS.

Q.—What are Bitters, and how are they divided?

They are vegetable tonics and divided into *Simple, Aromatic*, and *Peculiar bitters.*

Q.—How do the simple bitters differ from the aromatic and peculiar bitters?

The latter contain Gallic and Tannic acids, besides aromatic constituents, and are therefore more or less astringent.

Q.—What are the characteristics of the simple bitters?

They give tone to the digestion alone, and thereby improve the general nutrition without especially affecting other portions of the system.

Q.—Which are the Simple Bitters?

Calumba, chirata, cornus, eupatorium, gentiana, and quassia.

Q.—What are the physiological effects of the simple bitters?

They increase the secretions and impart tone to the mucous membranes, thus they promote digestion and increase the appetite for food, hence nutrition and the condition of the blood is improved.

Q.—What is the effect of their long continued use?

They disorder digestion and produce gastric catarrh.

Q.—Which is the mildest of the Simple Bitters?

Calumba.

Q.—Which is the most active?

Quassia.

Q.—What are the incompatibles of these bitters?

Salts of iron, lead and silver; though calumba. quassia, chirata and gentiana may be given with Iron.

Q.—What are the therapeutic uses of these bitters?

They are given to increase secretion and promote appetite in atonic dyspepsia, in chronic gastric catarrh and during convalescence from acute disease. To give tone to the mucous membranes in diarrhea and as vehicles for the administration of other medicines. An infusion of quassia will destroy ascarides.

Q.—What are the preparations and doses of these medicines?

Extractum Quassiæ,	dose gr. j–v
Extractum Quassiæ Fluidum,	dose ♏v–xx
Tinctura Quassiæ,	dose fʒj–ij
Extractum Gentianæ,	dose gr. j–xxx
Extractum Gentianæ Fluidum,	dose fʒss–j
Tinctura Gentianæ Compositæ,	dose fʒss–ij
Extractum Calumbæ Fluidum,	dose fʒss–j

Tinctura Calumbæ,	dose fʒss–ij
Extractum Chiratæ Fluidum,	dose ♏x–xx
Tinctura Chiratæ,	dose ♏v–fʒj
Extractum Cornus Fluidum,	dose ♏x–fʒj
Extractum Eupatori Fluidum,	dose ♏x–fʒj

Q.—How and at what time should the simple bitters be given?

Before eating, either alone or combined with other medicines, in pills, mixtures or solutions.

AROMATIC BITTERS.

Q.—How do the Aromatic Bitters differ from the Simple Bitters?

They are more stimulating to the mucous tract, because of the aromatic volatile oils which they contain, and are more or less astringent owing to the presence of tannic or gallic acids.

Q.—Mention the Aromatic Bitters.

Serpentaria, eucalyptus, prunus virginiana, anthemis, matricaria, magnolia, cascarilla, absinthum.

Q.—What are the chief chemical constituents of the Aromatic Bitters?

They all contain a volatile oil, a bitter principle, resin and tannic acid. The volatile oil of eucalyptus is composed of three oils of different density, *Eucalyptol* (an oxygenated oil), the lightest and most important, and *Terpene* and *Cymol:* that of Prunus Virginiana contains hydrocyanic acid; that of absinthum contains *absinthol.*

Q.—What are the physiological actions of the Aromatic Bitters?

Owing to the bitter principle which they contain, their action on digestion, nutrition and secretion is similar to that produced by the simple bitters. In addition, they have a stimulating influence on the mucous membranes, due to the volatile oils (which are eliminated by the bronchial mucous membranes, skin and kidneys), by increasing the bronchial secretions they are somewhat expectorant, also diaphoretic and diuretic. They possess an astringent effect, due to the tannic acid. In large doses they are emetic and laxative. The oil of eucalyptus possesses antiseptic properties, and will be more fully treated of under that head. Prunus Virginiana has a sedative influence over the pneumogastric nerve from the hydrocyanic acid which is contained in it, and thus quiets cough. Absinthum in large doses, or when habitually used in the form of liqueur (absinthe) produces epileptiform convulsions.

Q.—What are the therapeutic uses of the Aromatic Bitters?

They are used for the same purpose as the simple bitters. Serpentaria as a cardiac stimulant and tonic in low fevers, and as a stimulating expectorant; Eucalyptus in chronic catarrhal conditions, and as an antiseptic; Prunus Virginiana as a stomachic tonic and a cough-relieving agent.

PECULIAR BITTERS.

Q.—What are we to understand by Peculiar Bitters?

They are drugs, which, in addition to the properties of other bitters, have some other special characteristic by which each member of the class is distinguished.

Q.—Mention the Peculiar Bitters.

Cinchona and its alkaloids, salix and hydrastis.

CINCHONA.

Q.—What is Cinchona?

Cinchona is the barks of all species of Cinchona (Nat. Ord. Rubiaceæ.) They contain at least three per cent. of the peculiar alkaloids.

Q.—What is its habitat?

The mountainous regions of the western parts of South America from 22° south latitude to 10° north latitude, but the trees have been successfully cultivated in India, Ceylon, Java, the West Indies and other parts of the world.

Q.—What are the principle varieties of Cinchona?

The two principle varieties are *Cinchona Calisaya*, from which is derived *Cinchona flava* (yellow or calisaya bark) and the *Cinchona Succirubra*, whence comes the Cinchona rubra (red bark.) Other varieties are *C. micrantha* and *C. condaminea*, from which is obtained *Cinchona pallida*, or pale bark, no longer official.

Q.—How are they distinguished physically?

They both occur in quills and short pieces. The epidermis of the yellow variety is generally absent or only slightly adherent. The epidermis of the red variety is firmly adherent.

Q.—What are the active principles of Cinchona?

Quinine, *Cinchonine* and *Cinchonidine*, besides tannic kinic and kinovic acids.

Q.—Describe a chemical test for the Cinchona alkaloids.

If quinine and quinidine or their salts are treated with fresh chlorine water, an emerald green precipitate will form when ammonia water is added; when the same test is applied to cinchonine, cinchonidine or their salts, a white precipitate results.

Q.—What preparations of Cinchona are official?

Decoctum Cinchonæ Flava (℥j–Oj)	dose ℥ss
Infusum Cinchonæ (Ar. Sulph. Acidi $\frac{1}{100}$),	dose fʒj–f℥j
Extractum Cinchonæ,	dose gr. j–x
Extractum Cinchonæ Fluidum,	dose ♏x–fʒj
Tinctura Cinchonæ,	dose fʒss–fʒij
Tinctura Cinchonæ Composita,	dose fʒj–f℥ss

Q.—What is the composition of Tinctura Cinchonæ Composita?

Red Cinchona, 10 parts; bitter orange peel, 8 parts; serpentaria, 2 parts; alcohol, glycerin and water to make 100 parts.

Q.—What name is it generally known by?

Huxham's Tincture.

Q.—What is the physiological action of Cinchona?

Cinchona and its preparations are bitter tonics, increasing the flow of gastric juice, and improving the digestion. They are also astringent from the presence of tannic acid.

Q.—What are the therapeutic uses of Cinchona and its preparations?

Chiefly as a stomachic tonic, combined with the mineral acids in gastric catarrh, atonic dyspepsia, etc.

QUININA—Quinine.

Q.—What preparations of Quinine are official?

Quinina,	dose gr. j–ʒss
Quininæ Sulphas,	dose gr. j–ʒss
Quininæ Bisulphas,	dose gr. j–ss
Quininæ Hydrochloras,	dose gr. j–xx
Quininæ Hydrobromas,	dose gr. j–xx
Quininæ Valerianas,	dose gr. j–xx

Q.—Which of these preparations is most commonly used?

Quininæ Sulphas.

Q.—What are the physical properties of Quininæ Sulphas?

It occurs in a very light, whitish, transparent, silky crystals, with exceedingly bitter taste.

Q.—In what is it best dissolved?

In acids or acidulated water. It is almost insoluble in water, requiring 740 parts of cold, and 30 parts of boiling water for its solution.

Q.—How is the Bisulphate of Quinine obtained?

By dissolving the neutral sulphate of Quinine in water acidulated with sulphuric acid, after which the Bisulphate is recovered by evaporation.

Q.—What do you understand by Cinchonism?

Cinchonism is a term applied to a train of symptoms developed by the administration of Quinine in sufficient doses to produce the physiological effect of the drug.

Q.—What effects follow the administration of small therapeutic doses?

Ringing in the ears, fullness and constriction of the head.

Q.—What are some of the results of administering a large dose of Quinine?

Large doses affect the sight and hearing, occasionally producing temporary amaurosis and deafness.

Q.—What are the effects of toxic doses?

The above symptoms are intensified; complete deafness and blindness ensue, with delirium, stupor, weak, fluttering pulse, irregular and shallow respiration, convulsions, paralysis and collapse.

Q.—How does Quinine effect the brain?

It is an irritant to the membranes of the brain, and in large doses abolishes its functions.

Q.—How does it effect reflex action?

Very minute doses cause an increase in reflex activity by stimulating the peripheral sensory nerves. Small doses lessen, and large doses abolish reflex activity.

Q.—What effect has Quinine on the circulation?

Large doses lower the force and frequency of the pulse.

Q.—How does it do this?

By direct action on the heart.

Q.—What is the effect of an ordinary therapeutic dose of Quinine on the circulation?

It has no perceptible effect.

Q.—What effect has Quinine on the blood?

It lessens its ozonizing power.

Q.—What effect has Quinine on the uterus?

During labor it is a powerful stimulant to uterine contraction.

How is Quinine eliminated?

Partly by the kidneys and partly in the fæces.

Q.—What are the therapeutic uses of Quinine?

Quinine is used as a tonic to abort certain diseases, and as an antiperiodic, antiseptic, and antipyretic.

Q.—In what doses is it given as a tonic?

Gr. ij, three or four times a day.

Q.—What diseases is it used to abort?

Phneumonia, pleurisy, endocarditis and other inflammatory processes.

Q.—How should it be given under these circumstances?

In full doses of from twenty to forty grains.

Q.—In what ways are its antiseptic properties available?

Applied locally, it will arrest an incipient nasal catarrh. Administered internally, it will arrest the suppurative process of tonsilitis, and do good service in pyæmia, septicæmia, erysipelas, puerperal fever.

Q.—How is Quinine best administered?

In pill form rubbed up with gum, with a drop of dilute sulphuric acid to each grain; in powder, in solution or compressed tablet.

Q.—What is the objection to sugar coated pills?

Their coverings become hard and do not dissolve.

Q.—What idiosyncrasies exist toward Quinine?

In some it causes irritation of the bladder, œdema, and rash. In others its effect on the cerebrum are very marked.

Q.—How may these latter be obviated?

By adding dilute hydrobromic acid to the Quinine, gtt. ij–gr. j.

Q.—In what form should Quinine be administered hypodermatically?

As the bisulphate in an acidulated solution, or as the Hydrobromate of Quinine.

Q.—What danger attends its hypodermatic use?

It is precipitated by the alkaline juices of the cellular tissues, and causes intractable ulceration.

Q.—What is the physiological action of Cinchonine?

Similar to, but not as marked as Quinine, being about one third weaker.

Q.—What medicines are incompatible with Cinchona?

The alkalies and alkaline earths precipitate the alkaloids; tannic acid, gallic acid, the tincture and the compound solution of iodine form insoluble compounds with them, and the ferric salts precipitate Cincho-tannic acid from the preparations of Cinchona.

Q.—What are the Dental uses of the Alkaloids of Cinchona?

The salts of quinine are used in dentistry in the treatment of various facial and neuralgic affections, and as ingredients of dentifrices. In neuralgia of the fifth pair of nerves due to malaria, five to ten grain doses of sulphate of quinine are administered; in apthous ulcerations one or two grain doses every two or three hours are given, especially where there is great debility; in cancrum oris; also in the form of gargles and lotions, in gangrenous ulcerations of the mouth. As a tonic and antiseptic ingredient for dentifrices cinchona is employed in the form of powder. The sulphate of quinine is employed in reducing inflammatory conditions of the peridental membrane in its early stages before the effusion of inflammatory products, cell pröliferation, and escape of the white blood corpuscles. It has also been recommended in hypersensitive dentine, three or four grain doses every four hours until thirty grains have been taken (Klumps) (?)

The late Dr. W. H. Atkinson places great stress upon the value of sulphate of Cinchonidine in pyorrhœa alveolaris.

Give formulæ containing cinchona, its alkaloids and their salts.

Dentifrice.

℞	Pulv. Cinchonæ flav.,	ʒiv
	Pulv. saponis cas. alb.,	ʒiv
	Cretæ prep.,	℥ij
	Magnesiæ Calc,	℥iij
	Otto. rosæ,	gtt. viij
	Olei Caryophylli,	gtt vi

M.

Dentifrice.

℞	Pulv. Cinchonæ flav.,	ʒiij
	Cretæ prep.,	℥iij
	Sacchari albi,	℥j
	Pulv. Cinnamomi,	℥j
	Pulv. saponis cas. albi,	ʒij
	Pulv. Myrrhæ,	ʒj

M.

For Ulceration of Gums.

℞	Pulv. Cinchonæ flav.,	ʒij
	Cupri sulph.,	gr. x
	Acaciæ (pulv.),	ʒj
	Mellis,	ʒij
	Aquæ puræ,	℥iij

M. Signa: Apply with a camel's hair brush to ulcerated surfaces.

For a Wash after the Extraction of Teeth.

℞	Cinchonæ (decoct.),	f℥ij
	Aluminæ,	ʒij
	Infus. rosæ,	f℥ij

M. Signa: Use as a gargle.

For Neuralgia Associated with Anæmia.

℞	Tinct. Ferri Chloridi,	℥j
	Quininæ Sulphatis,	ʒj

M. Signa: Teaspoonful four times daily.

(Garretson.)

For Facial Neuralgia from Dental Disturbances.

℞	Ferri et Quin. (cit.),	ʒij
	Syrup Aurantii,	℥j
	Aqua. dest,	℥j
	Elix. Calisayæ,	℥ij

M. Signa: Coch. parv. ter. in die.

(Barrett.)

For Neuralgia from Dental Disturbances.

℞	Quininæ Sulphatis,	gr. x
	Ferri Sulph. exsic,	gr. v
	Acidi Arseniosi,	gr. ss
	Ext. nucis vomicæ,	gr. v

M. Ft. pil. No. xx.
Signa: One pill every four hours.

(Gorgas).

For Acute Periodontitis.

℞	Quininæ Sulphas,	ʒss
	Acidi Sulph. Aromat.	ʒij
	Elix. Calisayæ,	ʒxiv

M. Signa: A teaspoonful every two or three hours. (Gorgas.)

For Pyorrhœa Alveolaris.

℞	Cinchonidinæ Sulph.	ʒss
	Acid Sulph. Arom.	ʒij
	Alcoholis (95 per cent.)	℥iij
	Glycerini C. P.	℥ij
	Aquæ dest, q. s. ad.	℥xv
M.	Signa: One teaspoonful ter die as directed.	(Atkinson.)

SALIX—Willow Bark.

Q.—What is Salix?

Salix is the bark of *Salix alba* (Nat. Ord. Salicaceæ), or white willow. Other species of Salix are official.

Q.—What are its most important chemical constituents?

Salicin and tannic acid.

Q.—What are the principle preparations of Salix?

Salicin,	dose gr. x–ʒij
Salol, *Phenol Salicylate*,	dose gr. iij–ʒj
Acidum Salicylicum,	dose gr. v–ʒj

(The salicylates of sodium, lithium and physostigma are also official.)

Q.—Of what is Salol composed?

Sixty parts by weight of salicylic acid and forty of carbolic acid. Insoluble in water and almost tasteless and odorless.

Q.—What are the physiological effects of Salicin?

Salicin is a bitter tonic, an antipyretic, an antiferment and antiseptic, being destructive to low organisms. Salol is antiseptic, antipyretic and germicide in a higher degree than either of its constituents. It is sedative to the cerebro-spinal system and somewhat analgesic.

Q.—What are the therapeutic uses of Salicin and its derivatives?

Used chiefly in acute rheumatism, to lower temperature, relieve pain and reduce swelling.

Note.—The dental uses of these agents will be referred to again.

HYDRASTIS=Golden Seal.

Q.—What is Hydrastis?

Hydrastis is the rhizome and rootlets of *Hydrastis Canadensis* (Nat. Ord. Ranunculaceæ), an indigenous plant.

Q.—What alkaloids does it contain?

Hydrastine, *Berberine*, and *Xanthopuccine* in such small quantities as to be of little importance.

Q.—What are the preparations of Hydrastis?

Extractum Hydrastis Fluidum,	dose ♏v–fʒiv
Tinctura Hydrastis,	dose ♏x–fʒj

Q.—What are the physiological actions?

Hydrastis is an astringent bitter, promotes appetite and digestion, increases the secretions of the gastro-intestinal tract, and the flow of the bile. It is an anti-periodic, and a protoplasmic poison, arresting the movements of the white blood corpuscles.

Q.—What is its therapy?

Chiefly as a stomachic tonic, and antiperodic, a mild astringent, and an antiseptic, in catarrhal affections of mucous membranes, in syphilitic affections of the mouth, throat and nerves, ulcers, stomatitis, etc.

Q.—What are the Dental uses of Hydrastis?

All ulcerated conditions of mucous membranes are benefitted by the use of Hydrastis, both locally and internally.

Q.—How may Hydrastis be used as a mouth wash?

The tincture may be added to water, and freely used. The fluid extract, either in full strength or diluted with water or distilled witch-hazel, is likewise a beneficial local remedy in mercurial or apthous stomatitis.

AGENTS PROMOTING WASTE.

Q.—What are the principal agents for promotin waste?

Potassium,
Vegetable Acids,
Antimonium.
Lithium.
Sodium,
Sulphus, ites and ides.
Ammonium,
Calcium,

POTASSIUM—Kalium. Sym.—K.

Q.—What is Potassium?

A metallic element, described by Davy, in 1807, and very widely diffused through the vegetable, mineral, and animal kingdoms.

Q.—How is the Potassium of commerce usually obtained?

By the lixivitation of wood ashes.

Q.—What are the principal preparations of Potassium.

Potassa, *Caustic Potash*,	
Liquor Potassæ, 5 per cent. solution.	
Potassii Acetas,	dose gr. x–ʒj
Potassii Bichromas,	dose gr. ⅓
Potassi Bitartras, *Cream of Tartar*,	gr. xx–ʒiv
Antimonnii et Potassii Tartras, *Tartar Emetic*,	dose gr. $\frac{1}{40}$–gr.j
Potassii Bromidium,	dose gr. x–j
Potassii Chloras,	dose gr. ij–x
Potassii Iodidum,	dose gr. v–ʒj
Potassii Nitras, *Saltpetre*,	dose gr. ij–xx
Potassii Permanaganas	dose gr. ss–ij
Pulvis Effervescens Compositus, *Seidlitz Powder*.	

Q.—What is the composition of Seidlitz Powders?

Sodium Bicarbonate,	grs. xl
Rochelle Salt;	ʒij
In a paper together, and	
Tartaric Acid,	gr. xxxv

In a separate paper, to be dissolved separately, then mixed and taken while effervescing.

(The bromide is treated of under bromides, the permanganate under manganese).

Q.—What are the physiological actions of Potassium?

Caustic Potash, like the other caustic alkalies, locally applied, destroys the tissues by combining with their water, dissolving the albumen and saponifying the fats. The Potassium salts increase the saliva, promote oxidation and retrograde metamorphosis. In large doses these salts decompose the red corpuscles of the blood, and paralyze the motor ganglia of the heart. All Potassium salts, in large doses, are-cardiac poisons, muscular paralyzers, poisonous to protoplasm, especially to nerve tissues, and destructive to the ozonizing functions of the blood.

Q.—How is poisoning by the Caustic Alkalies treated?

By the vegetable acids; as vinegar, lemon juice, etc., then demulcents and oils to protect the mucous membranes, and sustaining measures to support the vital powers.

Q.—What are the therapeutical uses of Potassium salts?

The Posassium salts are used as duretics (increasing as they do both the water and salts of the urine. and converting uric acid into the more soluble urea as well as rendering them alkaline) in acute rheumatism, uric acid diathesis, in desquamative nephritis, and to alkalinize the urine in cystic or urethral irritation. Caustic potash is used as an escharotic, the permanganate as an antiseptic and disinfectant; the bicarbonate as an antacid and diuretic; the chlorate as a detergent wash, antiseptic and astringent; the bichromate as an application to warts, corns and venereal excrescences, and the iodide as an alternative.

Q.—What are the Dental uses of the Salts of Potassium?

Caustic potash is used in dental practice in gangrene of the mouth, malignant growths, fungous growths and for opening abscesses when it is not prudent to use the lancet. Combined with carbolic acid and iodine it is also used as an application to the gums in pyorrhœa alveolaris (Robinson's remedy.) The bicarbonate is used as an antacid to prevent injury to the teeth from acid medicines. Bromide as a nervous sedative, the chlorate as a resolvent and detergent, the nitrate in the incipient stages of alveolar abscess, and inflammatory conditions of the mucous membranes of the mouth and throat; the permanganate as an antiseptic and disinfectant, and the bichromate as an escharotic and as an ingredient of battery fluids.

Give formulæ containing the Salts of Potassium for dental practice.

For Neuralgia.

℞ Ferri Sulphatis exsic,
Potassii Carbonatis, āā gr. ccl
Syrup Acaciæ, q. s.
M. Ft. pil No. 100.

Signa: Begin with three a day and increase to six: take several hundred.

(GARRETSON.)

For Inflamed Gums After the Extraction of Teeth.

℞ Potassii Chloratis, ʒij
Tincturæ Krameriæ.
Glycerini, āā f℥ss
Aquæ Rosæ, ℥viij

M. Signa: To be used as a gargle six or light times a day to harden the gums.

(GORGAS.)

For Apthous and Secondary Syphilitic Ulcerations of the Mouth and Fauces.

℞ Potassii Chloratis, ℥iv
Aquæ dest. ʒx
M. Signa: To be used as an antiseptic mouth wash. (GORGAS.)

For Ulcerations of the Mouth.

℞ Potassii Chloratis, ʒj
Acidi Carbolici, ʒss
Aquæ dest. ℥iv
M. Signa: To be used as a lotion. (BARTHOLOW.)

Nor Inflammations of the Mouth and Throat.

℞ Potassii Nitratis, ℥ij–iv
Aquæ dest. Oj
M. Signa: To be used as a gargle. (WHITE.)

(For other formulæ see Gorgas' Dental Medicine.)

SODIUM—Natrium. Sym.—Na.

Q.—What is Sodium?

A metallic element, occurring abundantly in nature.

Q.—Is the metallic element used in medicine?

No; only in combination.

Q.—What are the principal preparations of Sodium?

Soda, Sodium, Hydrate. *Caustic Soda.*	
Sodii Boras, *Borax,*	dose gr. x-xl
Sodii Bromidium.	dose gr. xx-ʒj
Sodii Carbonas, *Washing Soda.*	dose gr.-xx
Sodii Bicarbonas, *Bakiag Soda.*	dose gr. v-xl
Sodii Chloridum, *Table Salt,*	dose gr. v-xl
Sodii Nitras, *Chilli Saitpeire,*	dose ʒj-ij
Sodæ Phenas. Phenol Sodique,	dose gtt. viij-xxx
Sodii Sulpho-Carbolas, [See Carbolic Acid.]	dose gr. j-x
Sodii Salicylas,	dose gr. v-ʒj
Sodii et Potas. Tartras, *Rochelle Salt,*	dose ʒiv
Sodii Ethylas (for external use.	
Liquor Sodæ Chloratis (Labarraque's Sol.) should contain at least two per cent. of available Chlorine,	dose fʒssj

There are many other compounds of Sodium for which the student is referred to larger text-books.

Q.—What are the physiological actions of the Salts of Sodium?

They are similiar to those of Potassium, except that soda salts are feebler alkalies, are not so depressant, and are not such powerful cardiac and nerve poisons.

Q.—What are the therapeutic uses of Sodium Salts?

Internally they are not much used, the Potassium and lithium salts being preferred. The salicylate, however, is a favorite remedy in rheumatic and uric acid diatheses. Locally the caustic soda is more manageable and less severe than the caustic potash. The Ethylate and Sodium is powfully caustic, and is used for the removal of warts, excrescences, ulcers, etc. The carbonate and bicarbonates are used as antacids, antiseptics, detergents and analgesics, and as antidotes to acid poisons. The borate as an antacid refrigerant, diuretic and emmenagogue.

Q.—What are the Dental uses of the Salts of Sodium?

The bicarbonate is used as an antacid ingredient of dentifrices and a mouth wash. Also as an antacid application to pulps and sensitive dentine. The carbonate is employed for the same purpose, but more especially is it used in canals containing putrescent pulps to saponify their contents and facilitate their removal. The constant application of the carbonate to the pulps of children's teeth will devitalize them and obviate the dangers of arsenic.

Q.—For what purpose is the Borate of Sodium used in dentistry?

In the laboratory as a flux for melting metals; in soldering metals, and in solutions for hardening plaster. It is used as a local application to mucous patches, etc., as an ingredient of mouth washes and dentifrices.

Q.—What is Phenol Sodique, or Sodæ Phenas?

A phenate of soda.

Q.—What formula is given for its preparation?

Pure Melted Carbolic Acid,	5 parts
Sol. of Caustic Soda, s. p. 1,332,	1 part
Distilled Water,	5 parts

Mix.

Q.—What are its Dental uses?

It is employed as an astringent and a styptic, anodyne and antiseptic. It is antiphlogistic, with little or no escharotic action. As a mouth wash for unhealthy gums and oral tissues it is good. Also as a deodorizer in offensive breath.

Q.—What is the usual strength of the solution employed?

From a teaspoonful of phenol sodique to a glass of water, up to equal parts.

Q.—What are the Dental uses of Sodii Salicylas?

Neuralgias of rheumatic origin succumb nicely to the administration of the Salicylate of Sodium, as do also some forms of pericementitis and periostitis.

Q.—What are the Dental uses of Caustic Soda.

As an escharotic it is valuable (either alone or combined) as an application in pyorrhea alveolaris, tumors, fungous growths, etc., found within the oral cavity.

Q.—What are the Dental uses of the Bromide and Chloride or Sodium?

The bromide is used as a nerve sedative, the chloride as an ingredient for washes, etc., as a styptic, and to hasten the hardening of plaster of paris.

Q.—For what purpose is Labarraque's solution employed?

As a disinfectant, deodorizer and antiseptic in all affections of the mouth, attended with fetid discharge. In diseases of the antrum, cancrum oris, necrosis, scurvy, etc., and as a bleaching agent for discolored teeth.

Q.—How is it used to bleach discolored teeth?

In combination with powdered alum.

Q.—What precautions are necessary?

The foramen should be closed, and the balance of the mouth protected from the medicament. The bottle should have a glass stopper and be protected from light and heat.

Q.—How is the Ethylate of Sodium used?

As an escharotic. It is extremely powerful in its action, and is objectionable to some. Sometimes it is used to destroy the pulps of children's teeth.

Q.—Give a few Dental formulæ.

For Apthous Ulcerations, Parasitic Formations and Diphtheritic Conditions.

℞	Sodæ Hyposulphitis,	ʒij
	Syrup Auranti,	ʒiv
	Aquæ dest:	℥iv

M. Signa: To be applied as a lotion or mouth wash. Stimulant and antiseptic. (GORGAS.)

For Fissured Tongue.

℞	Sodæ Biboratis,	gr. xl
	Glycerini,	ʒj
	Aquæ dest.	℥iv

M. Signa: To be used as a gargle, (WHITE.)

A Detergent Alkaline Gargle

℞	Sodæ Biboratis,	ʒiv
	Glycerini,	
	Tinct. Myrrhæ,	āā ℥ss
	Aquæ Dest.	℥x
M.		(GORGAS.)

Neuralgia from Dental Disturbance.

℞	Sodii Salicylatis,	℥j
	Ft. pulv. in Cap. No. iij	

Signa: One capsule every three hours.

For Apthæ and Ulcerations of The Mouths of Children.

℞	Liq. Sodæ Chlor	
	Tinct. Myrrhæ,	āā f℥ss
	Aquæ Rosæ,	f℥j
	Aquæ,	f℥vi
M	Signa: To be used as a lotion.	(GORGAS.)

For Offensive Breath.

℞	Liq. Sodæ Chlor.	ʒj
	Aquæ,	℥iv
M.	Signa: To be used as a gargle.	(GORGAS.)

(For other formulæ see Gorgas' Dental Medicine.)

LITHIUM. Sym.=Li.

Q.—What is Lithium?

A chemical element found native in the form of silicates, phosphates, etc.

Q.—What are the preparations of Lithium?

Lithii Benzoas,	dose gr. v–xx
Lithii Bromidum,	dose gr. v–xx
Lithii Carbonas,	dose gr. v–xx
Lithii Citras,	dose gr. v–xx
Lithii Salicylas,	dose gr. v-xx

Q.—What are the physiological actions of the Salts of Lithium?

They act purely as alkalies, being the most decided of the group.

Q.—What are the therapeutic uses of these salts?

They are but few, used sometimes in indigestion and rheumatism, lithæmia, myalgia, diabetes mellitus, etc.

CALCIUM Syn.=Ca.

Q.—What is Calcium?

A chemical element, and the metallic base of Lime. It is an essential·constituent of the human body.

Q.—What are the principal official Salts of Calcium?

Calx, *Quicklime* (not used internally).	
Calx Chlorata.	
Calx Sulphurata,	dose gr. ¼-ij
Calcii Chloridum,	dose gr. j-xx
Calcii Hypophosphis,	dose gr. x-xx
Calcii Bromidum,	dose gr. x-xxx
Calcii Phospha Precipitatas	dose gr. x-xxx
Calcii Carbonas Precipitatas,	dose gr. x-xl
Creta Preparata	dose gr. x-xx

Q.—What are the principal official preparations of these salts?

Syrupus Calcii Lactphosphatis,	dose fʒj-ij
Syrup Calcis,	dose fʒss-j
Syrupus Hyphosphitum,	dose fʒss-ij
(Lime gr. iij, Potassium gr. j. Sodium gr. j. in fʒj)	
Hydrargyrum Cum Creta	dose gr. j-xx
(Mercury 38, Chalk 50, Milk Sugar 18 parts.)	
Misturæ Cretæ	fʒj-iv
Liquor Calsis 0.15 per cent.,	f℥ss-ij
Testa Preparata, *Prepared Oyster Shells*,	gr. v-xx
Liquor Calcis Cholorata, *a Disinfectant.*	
Lotio Hydrarygri Nigra, *Black Wash*,	
(Calomel gr. xxx Lime-water f–℥x)	
Lotio Hydragyri Flava, *Yellow Wash*,	
(Corrosive Sublimate gr. xviij, Lime-water f℥x)	
Calcii Carbolas, *a Disinfectant.*	

Q.—What is Lime?

The oxide of the metallic element, Calcium.

Q.—What are the physical properties of Lime?

When fresh from the lime-kilns it is in large, hard grayish masses, constituting what is known as quick, lime, which has a great affinity for water, even taking it from the air. Under the influence of moisture, lime generates heat and breaks up into a wet powder, which is a mixture of Calcium oxide and Calcium carbonates, and constitutes slacked lime. Calcium oxide is more soluble in cold than in hot water.

Q.—What is Plaster of Paris?

It is the anhydrous Calcium Sulphate, or Calcined Gypsum, *i. e.*, the Gypsum has been heated to 392° F., thereby losing its water of crystalization, two molecules.

Q.—Why is it called Plaster of Paris?

Because it was originally procured from Montmartre, in the immediate vicinity of Paris.

Q.—What is Creta Perparata?

The native friable Carbonate of Calcium, freed from most of its impurities by elutriation.

Q.—What is Liquor Calcis, and how is it prepared?

It is a saturated solution of lime in water, and is prepared by pouring upon some freshly slacked lime a quantity of pure water, allowed to stand for a few hours. The solution will become clear, and the clear liquid is poured off as it is wanted for use.

Q.—What are the physiological actions of the preparations of Calcium?

Feebly alkaline, they ar emere astringent antacids. The actions of the Phosphate have already been described. The Syrup of lime is the antidote to Carbolic acid, or Oxalic acid poisoning.

Q.—What are the therapeutic uses of the preparations of Calcium?

Lime-water is used in the summer vomiting of children, and is added to their milk when the latter is not well retained.

Chalk Mixture is prescribed in the diarrhea of children, with sour smelling watery stools. Lime is an ingredient in depilatory powders and is also used for disinfecting purposes, as an application to burns, eczema and pruritis. Lime-water is valuable combined with rose-water, glycerin or one of the oils. Calx Sulphurata is useful in styes, acne and furuncles; and valuable antispasmodic properties have been ascribed to Calcium Sulphite.

Q.—What preparations of Calcium are of especial use and interest to the Dental practitioner?

Calcium Sulphate.
Calcium Sulphide.
Calcium Oxide.
Lime-water.
Calx Chlorata.
Calcium Hypophosphite.
Calcium Carbolate.
Calcium Sulphite.
Calcium Carbonate.
Calcium Hydrate.
Calcium Fluoride.
Calcium Phosphate.
Chalk Mixture.

Q.—Why is Calcium Sulphate of interest?

It is from this we obtain our well known Plaster of Paris.

Q.—What are the Dental uses of Plaster of Paris?

It is employed to make moulds, casts, and immovable surgical dressings.

Q.—What substances can be added to Plaster of Paris to make it harder and less porous?

Alum, gelatine and sugar.

Q.—What substance will hasten its hardening?

Table salt.

Q.—What especial interest belongs to the Sulphite and Sulphide?

A mixture of these two salts commonly and commercially known as Sulphide of Calcium, though more correctly as Calx Sulphurata, is employed both to prevent the formation, and to hasten the evacuation of pus.

Q.—What is the physiological action of the Sulphide of Calcium?

At the present stage of our knowledge it is uncertain. The theory has been advanced, and results seem to prove the following: 1st, that it has a stimulating effect on the blood-current, especially that of the glandular elements of all mucous membranes and the skin; 2d, the action on the circulation increases normal or subnormal secretion, and checks that due to venous congestion, or blood stasis; 3d, the production of H_2S

in the system, which has a restraining influence on the amœboid movements of the leucocytes.

Q.—For what conditions should it be administered in dental practice?

Paradoxical as it may seem, both to prevent, and to hasten the results of abscess.

Q.—In what doses should it be given?

From $\frac{1}{10}$ to $\frac{1}{2}$ grs. hourly, or from $\frac{1}{4}$ to 2 grs, thrice daily, owing to conditions present and results desired.

Q.—In what form is it best prescribed?

In the form of pills, now so nicely prepared by all manufacturing chemists.

Q.—What interest attends the carbonates, oxide and hydrate of Calcium?

From the oxide the hydrate is produced, which is a mixture of oxide and carbonate, and is the foundation of our lime-water. The carbonate being the basis of our chalk.

Q.—What are the dental uses of Creta Preparata?

As an ingredient of dentifrices, as a polishing powder, and as an antacid, absorbent and astringent.

Q.—What is the formula for Chalk mixture, and its Dental uses?

℞ Cretæ Preparata, ℥ss
Acaciæ, gr. cxx
M Aquæ, f℥iv

It is often combined with opiates and astringents, such as Laudanum and Tinct. of Kino. or of Catechu, in the treatment of diarrhea. Dose ʒj-℥ss.

Q.—What is the Dental value of Lime Water?

Lime-water holds in suspension only 0.15 per cent. of the calcium hydroxide, making a mild though excellent antacid, favors gastric secretion, and allays gastric irritability. It is also often given with a view to supply lime salts to the tissues. In young patients, when the teeth are soft in structure and sensitive, it is also useful.

Q.—What is the Dental value of Phosphates?

They are especially useful in rickets, mollites ossium, delayed union of fractures, caries and necrosis of bone, anæmic of nursing women, abscesses, and early decay of the teeth in children.

Q.—What preparation is recommended for this purpose?

Syrupus Calcii Lactophoshatis.

Q.—What is the formula for the syrup of the lactophosphate of lime, and its dose?

Precipitated phosphate of Calcium,	22 parts.
Lactic Acid,	33 parts.
Orange flower water,	80 parts.
Sugar,	600 parts.
Hydrochloric acid. water of ammonia and water, a sufficient quantity	dose fʒj.℥j.

Q.—Of what Dental interest is Calcium Fluoride?

Human bone contains about two per cent., and the enamel of teeth contains it also.

Q.—Of what value is Calx Chlorata to the dentist?

Chloride of lime is a stimulant, deodorizer, disinfectant, antiseptic and bleaching agent; employed in cancrum, oris scorbutic and other ulcerations of the mouth, and to correct the fetor of breath. One of its most important uses is as a bleaching agent, either alone or in combination with other substances.

Q.—Of what use is the Carbolate of Calcium.

Used as a disinfectant.

Give some Dental formulæ containing the preparations of Calcium.

For Cancrum Oris.

℞	Calc. Chlorat,	ʒss
	Mulcilaginis,	℥ss
	Aquæ dest,	℥iij-ss

M. Signa: To be used as a lotion. (BARTHOLOW.)

For Fetor of the Breath.

℞	Calc. Chlorat	ʒii
	Aquæ dest.	
	Alcoholis,	āā ℥ij
	Ol Rosæ,	gtt. iv.

M. Signa: A teaspoonful in a tumbler of water, used as a gargle. (BARTHOLOW.)

For Diarrhea of Children, Due to Sour Stomach.

℞	Creasoti	♏iv.
	Tinct. Opii Camph.	fʒj
	Mist. Cretæ, q. s. ad	f℥ij

M. Signa: A teaspoonful every two hours to a child two years old. (SHOEMAKER.)

For Chronic Bronchitis, Debility and Wasting Diseases.

℞	Syrupus Calcis Laetophosphatis,	f℥iij
	Olei Gaultheriæ,	♏xxx
	Pulvis Acaciæ,	ʒj
	Liquor Pancreatici,	f℥j
	Olei Morrhuæ,	f℥v

M. et. ft emulsio.

Signa: A teaspoonful three times a day. (SHOEMAKER.)

Dentifrice.

[Am. Dent. Association.]

℞	Cretæ Preparata,	℔ iij
	Pulv. Cinchonæ,	℔ j
	Pulv. Radicis Iridis,	℔ j
	Pulv. Sacchari Albi.	℔ iss
	Pulv. Saponis Cas.	℥j
	Sodii Carb,	℥j
M.	Olei Sassafras,	gtt. lxxx

(For other Formulæ see Gorgas' Dental Medicine.)

AMMONIUM.

Q.—What is Ammonium?

The supposed metallic base of Ammonia.

Q.—Has Ammonia ever been isolated?

No, and has therefore only a hypothetical existence.

Q.—What are the compounds of Ammonium?

Hydrate, *Ammonia Water.*
Carbonate, *Hartshorn Salt, Sal. Volatile.*
Chloride, *Muriate, or Sal. Ammoniac.*

Q.—What are the official preparations?

Aqua Ammoniæ (10 per cent.),	dose ♏ij–x
Aqua Amoniæ Fortior (28 per cent.) External use.	
Linimentum Ammoniæ.	
Spiritus Ammoniæ, *Hartshorn.* 10 per cent.	dose ♏v–xv
Spiritus Ammoniæ Aromaticus (21 per cent.),	dose fʒss–ij
Liquor Ammonii Acetatis, *Spirits of Mendererus,*	dose fʒj–iv
Tinctura Guaaci Ammoniata,	dose ♏xxx–Lx
Tinctura Valerianæ Ammoniata.	dose fʒss–j

Solid Preparations.

Ammonii Benzoas,	dose gr. ij–x
Ammonii Bromidum,	dose gr. x–xv
Ammonii Carbonas,	dose gr. ij–v or xx
Ammonii Iodidum,	dose gr. v–x
Ammonii Nitras.	
Ammonii Sulphas.	
Ammonii Phosphas,	dose gr. ijss–xx
Ammonii Valerianas.	dose gr. ij–v
Trochisci Ammonii Chloridum.	
Ammonii Boras,	dose gr. iv

Q.—What are the physiological actions of Ammonia?

Ammonia is a gaseous body, intensely alkaline, and irritant to mucous membranes; it exists normally in the blood, to maintain its fluidity by helping to keep its fibrin in solution. It stimulates the trifacial nerve, increases the blood tension by reflex action upon the vaso-motor centre; and prevents syncope. Its salts, in medicinal doses, act as stimulant expectorants, diffuse rapidly, and stimulate the heart's action. In large quantity they injure the structure of the red blood corpuscles. Ammonia possesses marked antiseptic virtues.

Q.—What are the physiological antagonists of Ammonia?

As water of Ammonia is a common household article, cases of poisoning are not infrequent. If inhaled, give HCl vapors by inhalation to form the chloride. If taken in solution, give vegetable acids and demulcents to protect the mucous membrane. The therapeutical antagonists are the cardiac sedatives: aconite, digitalis veratrum, etc.

Q.—What are the therapeutic uses of Ammonia?

As stimulating expectorants the chloride and carbonate are useful. It is used as a cardiac stimulant, both internally and by inhalation, but its effects are of brief duration. It is also an antagonist to the action of snake, and prussic acid poisoning on the heart, but should here be employed as an adjuvant to alcohol. It is given hypodermatically for sudden cardiac failure during anæsthesia, or from surgical shock; by intra-venous injection to maintain the fluidity of the blood in case of threatened cardiac thrombosis. It is given as an alkali in acidity, flatulence, and in nervous head-ache. Externally it is an ingredient of stimulating and irritating liniments, and may be used as a vesicant.

Q.—Far what purpose are the sulphate and nitrate of Ammonium used?

These salts are only used in making other official preparations.

Q.—What are the Dental uses of Ammonia?

As a stimulant in narcosis when dangerous symptoms are present. Ammonia is useful as a preventive in threatened syncope or severe shock. The chloride combined with aconite and opium is serviceable in neuralgia and periodontitis, and the water of ammonia is applied locally as a counter-irritant in acute inflammation of the pericementum. In cancrum oris the carbonate is a valuable internal remedy; also in murcurial erethism in conjunction with camphor and other stimulants. The Valerianate is valuable as an agent to influence hysterical manifestations and allay neuralgic symptoms. The nitrate is used to prepare nitrous oxide gas, which it yields by exposure to heat.

Q.—If the water of Ammonia is used in narcosis, etc., and very prompt effects are needed, where should the injection be made?

Directly into a vain [♏x–xx.]

Q.—What effects follow the injection of a large quantity of Ammonia into a vein?

It causes an increase in the respiratory rythm, a momentary fall in arterial pressure, succeeded by a sudden rise and the development of convulsions ending in death.

Q.—To what is the increase in the respiration due?

To a direct action on the respiratory centres in the medulla oblongata.

Q.—To what is the preliminary fall of arterial pressure due?

To the powerful action of the drug on the heart.

Q.—To what is the subsequent rise due?

To the stimulant effect of Ammonia on the accelerator nerves of the heart.

Q.—How does Ammonia affect reflex activity?

It increases it.

Q.—What is the indication for the use of Ammonia?

Sudden heart failure from whatever cause arising.

Q.—How often should the preparations of Ammonia be exhibited in heart failure.

Every half hour, as their influence is highly fugacious.

Q.—For what purpose is the Sulphate of Ammonia used?

To make the preparation ammonio-ferric-alum.

Q.—Is this preparation of service to the dentist?

Yes; it is highly styptic.

Q—What advantage does the Aromatic spirits of Ammonia possess?

Being of more pleasant taste, is best suited for an internal remedy where time will permit.

Q.—What is "Raspails Eau Sedatif?"

Aquæ Ammoniæ,	℥ij
Sodii Chloridi,	℥ij
Spts. Vini Camph.	ʒiij
Aquæ,	℥xxxij

M.

Q.—What is the composition of aromatic spirits of Ammonia?

Ammoniæ Carbonatis,	℥viij
Liquor, Ammoniæ Fortis,	℥iv
Olei Myristicarum,	ʒiv
Olei Limonis,	ʒvi
Spts. Vini Rectf.	Ovj
Aquæ Dest.	Oiij

Misce. Distil seven pints, s. p. gr. 0.870.

Q.—For what purpose is this preparation especially adapted?

For speedily arousing the action of the vascular and respiratory system, and for the prompt alleviation of spasms.

Give some formulæ containing preparations of Ammonia.

For Neuralgia.

℞	Lin. Ammoniæ,	f℥ij
	Spts. Chloroformi,	f℥j
	Lin. Mentholis,	f℥ij
	Tinct. Opii,	f℥j

M. et Signa: Apply well upon the surface. (SHOEMAKER.)

For Hysterical Manifestations.

℞	Ammonii Valerianatis,	gr. c
	Elixir Aurantii Rubri,	f℥viij
	Aquæ Ammoniæ,q. s. ad react. neut.	

M. et Signa: Dose a tablespoonful. (SHOEMAKER.)

For Threatened Syncope.

℞	Spir. Ammoniæ Aromat,	gtt. xxx

M. Signa: To be taken well diluted with water

ANTIMONIUM—Antimony. STIBIUM. Sym.=Sb.

Q.—What is Antimony?

A metallic element usually found in nature in the form of black antimonious sulphide.

Q—What are the medicinal preparations of Antimony?

Antimonii et Potassii Tartras, *Tartar Emetic*,	dose gr. $\frac{1}{16}$–$\frac{1}{4}$
Vinum Antimonii, (has two grains of Tartar Emetic to the ℥),	dose ♏v–℥ij
Syrupus Scillæ Compositus,	dose ♏v–℥j
(*Cox's Hive Mixture*, contains about $\frac{3}{4}$ gr. of Tartar Emetic to the ℥ with Squill, Senega, Calcium Phosphate, Diluted Alcohol, Sugar and Water.)	
Pulvis Antimonialis,	dose gr. iij–viij

(*Jame's Powder*, is one-third Oxide of Antimony and two-third Calcium Phosphate.)

Q.—What are the physiological actions of Tartar Emetic?

Tartar Emetic is a systemic and local emetic, a diaphoretic, an arterial sedative, and a gastro-intestinal irritant. As an emetic it is too depressing for use. It promotes waste and the rapid excretion of waste products.

Q.—What are the toxicological effects of Tartar Emetic?

Vomiting with burning pain in the epigastrium, severe colic, purging, and small frequent pulse and early collapse. Death results from exhaustion, or from resulting gastro-intestinal inflammation.

Q.—What is the antidote to this poison?

Tannic Acid, which renders the salt insoluble, to be followed by demulcents and anodynes to relieve the pain. Depression counteracted by alcohol and digitalis.

Q.—What are the therapeutic uses of the antimonials?

At one time quite fashionable, and greatly misused, are now seldom employed. They are serviceable, however, in acute cold and bronchitis, asthma and emphysema, and for the wheezing of young children with dyspnœa and cough simulating asthma. As a counter-irritant Tartar Emetic is sometimes applied to the skin, though rarely.

Q.—Has Antimony any Dental value?

Yes. It is used as a constituent of alloys, to give hardness to other metals, and to cause them to expand on cooling. Sometimes used in amalgams, and in small quantities is said to be of possible value in controlling shrinkage.

VEGETABLE ACIDS.

Q.—What Vegetable Acids are used in medicine and their doses?

Acidum Aceticum Dilutum,	dose, ʒj–ij
Acetum, *Vinegar* (An impure dilute acetic acid),	
Acidum Citricum,	℥ss–ij
Acidum Tartaricum,	dose gr. x–xx

Q.—What is Acetic Acid?

Acetic Acid is the result of the fermentation of saccharin fluids, after alcoholic fermentation is over.

That of the U. S. P. is a watery solution composed of 36 per cent. of hydrogen acetate, and 64 of water.

Q.—What per cent. of Acetic Acid does the dilution contain?

Six per cent.

Q.—What is the Glacial Acetic Acid?

It is nearly or quite absolute Acetic Acid. It is very corrosive.

Q.—What is the strength of Vinegar?

About 5 per cent. of Acetic Acid.

Q.—From what is Citric Acid obtained?

Lime, or Lemon Juice.

Q.—What is the source of Tartaric Acid?

A precipitate, known as Tartar or Argol, which remains after the conversion of the juice of the grape into alcohol.

Q.—How is Tartaric Acid obtained from Tartar?

By first forming a tartrate of calcium with lime, and precipitating sulphate of calcium by the addition of sulphuric acid. The sulphate of calcium falls to the bottom, and the Tartaric Acid remains in solution.

Q.—What are the physiological actions of Vegetable Acids?

In concentrated form they have escharotic powers, and produce gastro-enteritis if swallowed. In dilute form they diminsh thirst and allay restlessness. They promote secretion and increase the water of the urine.

Q.—For what purpose is Tartaric Acid used in medicine?

Chiefly to render alkaline urine acid, and as an ingredient for Seidlitz powders.

Q.—For what purpose is Acetic Acid used in medicine?

In the form of vinegar or diluted Acetic Acid, chiefly as an application for sunburn and as a gargle in sore throat. The glacial is used as a caustic for the destruction of warts and a parasiticide in ringworm, etc.

Q.—For what purposes is Citric Acid used in medicine?

As a refrigerant drink in fevers, acute rheumatism, as a proplylactic against scurvy, and to check the formation of acids in the stomach.

Q.—For what purpose is Glacial Acetic Acid used by dentists?

Externally as a caustic,

Q.—For what purposes is Tartaric Acid used by dentists?

Combined with "chloride of lime" to bleach discolored teeth, and as an addition to bichloride of mercury solution to render it more stable and prevent its tendency to coagulate albumen.

Give Dental formulæ.

For Indolent Ulcers of the Mouth, Cancrum Oris, Scurvy.

℞	Acidi Acetici,	f℥iij
	Aquæ,	f℥v
M.	Ft. Sol.	
	Signa: Apply with a camel's hair brush.	(GORGAS.)

For Inflamed Fauces.

℞	Acidi Acetici,	fʒij
	Ammonii Chloridi,	ʒj
	Mellis,	fʒiss
	Aquæ,	fʒxij
Ft. gargarysma.		(GORGAS.)

SULPHUR. —ites, —ides. Sym=S.

Q—What is Sulphur?

A yellow, inflammable, non-metallic, simple substance of volcanic origin.

Q.—What forms of Sulphur are official?

Three forms of the element, differing only in physical condition.

Q.—What are the preparations?

Sulphur Sublimatum,	dose gr. x–xx
Sulphur Lotum,	dose gr. v–xxx
Sulphur Precipitatum,	dose gr. x–xxx
Sulphuris Iodidum,	dose gr. ss–j
Unguentum Sulphuris,	
Unguentum Sulphuris Alkalinum,	
Pulvis. Glycyrrhizæ Compositus,	dose ʒj–ij

Q.—What are the official Sulphates?

The sulphates of sodium, potassium and magnesium, and the bisulphite and hyposulphite of sodium.

Q.—What are the recognized sulphides?

The sulphides of calcium, potassium and antimonium.

Q.—What is Ichthyol?

A preparation obtained from a bitumen found in Tyrol, and regarded as a residue of extinct fishes. It contains sulphur in the proportion of about 10 per cent.

Q.—What are the physiological properties of Sulphur?

It is a lemon-yellow color, tasteless, odorless and brittle. Melts at 237° F. Insoluble in water, very slightly soluble in alcohol, ether and benzin, its best solvent being bisulphide of carbon. It is partially soluble in alkaline solution, petroleum, the fixed and volatile oils. It has powerful chemical affinities and in combination with oxygen forms sulphurous and sulphuric acids, which, with bases form sulphites and sulphates.

Q.—What is meant by Sublimed Sulphur?

A fine yellow powder, the result of sublimation and condensation of the crude variety?

Q.—What is meant by Sulphur Lotum?

Sublimed Sulphur digested with aqua ammoniæ and thoroughly washed and seived.

Q.—What effect is produced by this process?

The Sulphur is freed from contamination with arsenic, sulphurous or sulphuric acid.

Q.—What is meant by precipitated sulphur?

The sublimed variety boiled with slaked lime and water. The sulphide and hyposulphide of lime thus formed are dissolved with hydrochloric acid and the precipitated Sulphur is washed and dried.

Q.—What are the physiological actions of Sulphur and its compounds?

Sulphur is a mild laxative, disinfectant and germicide. Sulphurous Acid is a powerful disinfectant and deodorizer, and destructive to all low forms of life. The effects of the Sulphites depend upon the Sulphurous acid which they contain. Taken internally they are decomposed by the acid of the gastric juice, evolve sulphurous acid, are finally converted into sulphates, and thus absorbed and eliminated. The Sulphides in repeated small doses have the power of arresting the suppurative process.

Q.—What are the therapeutic uses of Sulphur and its compounds?

Sulphur is used as a laxative in hemorrhoids, fissure of the anus, and after operations on the rectum, as an alterative in muscular rheumatism, sciatica, and lumbago, and as a parasiticide in scabies and other skin diseases.

Those compounds producing Sulphurous acid are used to fulfil the indications of the acid, while the Sulphides are used as alteratives and disinfectants, more especially as preventives to pus formations, or to hasten its expulsion.

Q.—How is Calx Sulphurata prepared?

By heating together 100 parts of powdered lime and 90 parts of precipitated Sulphur.

Q.—What are its physical appearances?

It is a whitish powder of an alkaline reaction and having a disagreeable taste.

Q.—What is its dose?

Gr. $\frac{1}{10}$–ij.

Q.—How is it administered?

In the form of a trituration with sugar of milk, or pills.

Q.—What is the result of its administration in abscesses?

If given early, it prevents the formation of pus, but if suppuration has occurred it limits its extent and favors early and complete evacuation.

Q.—What are the Dental uses of Sulphur?

Sublimed Sulphur (known also as Flowers of Sulpher) is used in the manufacture of dental rubbers. It has also been recommended as a dentifrice in excessive deposits of salivary calculus. (The uses of sulphurous acid have been described under the head of Mineral Acids).

Q.—Upon what hypotheses is it claimed that Sulphur is beneficial as a dentifrice?

That it is dissolved by the fatty matters of the saliva and mucous membrane, and is in part converted into Sulphuric and Sulphurous acids. That the Sulphuric acid (largely diluted as it is) partially dissolves and disintegrates the calculus, while the Sulphurous acid, having a particularly fatal influence on the lower forms of animal and vegetable life, owing to its anti-oxygenating influence, suffocates organic beings by denying them the oxygen necessary for existence.

Q.—How then should it be prescribed for this purpose?

Alone.

Q.—What would be the effect of combining Sulphur with creta preparata?

The creta preparata being an alkali would prevent the formation of the acids and render the compound inert.

Q.—In what cases is Calcium Sulphide useful to the Dental practitioner?

In threatened and existing alveolar abscesses, in phagedenic pericementitis, and in all catarrhal affections.

Formulæ.

℞	Sulphuris Sublimat,	℥ss

Signa: To be used as a dentifrice two or three times weekly.

For Abscesses.

℞	Calcis Sulphuratæ,	gr. iij
	Sacch. lactis,	q. s.

M. et. ft. trit. Div. in Chart, No. xxx

Signa: One powder every one or two hours.

℞	Pil Calcis Sulphuratæ,	gr. 1/10 No. xx

Signa: One pill every half, one or two hours.

For Catarrhal Effusion.

℞	Pil Calcis Sulphuratæ,	gr. ¼ to j No. xx

Signa: One pill t-i-d after meals.

ALTERATIVES.

Q.—What remedies are usually classed as Alteratives?

Iodine, Iodides.
Xanthoxylum.
Colchicum.
Fucus Vesiculosus.
Sanguinaria.
Gold.
Berberis.
Stillingia.
Mercury.
Mezereum.
Guaiacum.
Sarsaparilla.

IODINE—Iodine. Sym.=I.

Q.—What is Iodine?

Iodine is a non-metallic element existing in sea-water and sea-plants.

Q.—What are its physical properties?

It occurs in bluish-black rhombic scales, having a metallic lustre, an acrid taste, and evolving an odor similar to that of chlorine. It is sparingly soluble in water (1 in 7,000), readily so in ether and in alcohol (1 in 12), also in a solution of potassium iodide or sodium chloride.

Q.—What is the dose of Iodine?

From gr. ss–ij, but it is never administered in crude form.

Q.—What preparations of Iodine are official?

Amylum Iodatum, 5 per cent.,	dose gr. ij–ʒj
Liquor Iodi Compositus, *Lugol's Solution*, (Iodi 5, Potas. Iod. 10, Dist. water 55 parts,)	dose ♏v–xx
Tinctura Iodi, 8 per cent.,	dose ♏j–v
Unguentum Iodi, (I. 4, Pot. Iod. 1, Aq. 2, Adeps 93).	

Q.—What Salts of Iodine are official?

Potassii Iodidum,	dose gr. v–ʒj
Sodii Iodidum,	dose gr. ij–xx
Ammonii Iodidum,	dose gr. ij–x
Argenti Iodidum,	dose gr. j–ij
Arsenii Iodidum,	dose gr. $\frac{1}{20}$
Sulphuris Iodidum,	dose gr. j–iv
Hydrargyri Iodidum Viride,	dose gr. $\frac{1}{10}$–$\frac{1}{3}$
Hydrargyri Iodidum Rubrum,	dose gr. $\frac{1}{40}$–$\frac{1}{10}$

Plumbi Iodidum (For external use).	
Ethyli Iodidum, *Hydriodic Ether*, For Inhalation.	dose ♏ v–xv
Iodoformum, *Iodide of Formyl*, Unofficial.	dose gr. j–v
Iodol,	dose gr. ¼–v
Aristol (Used externally).	

(Iodoform, Iodol and Aristol will be described in their appropriate places.)

Q.—What is meant by Iodism?

The derangement of the system produced by the continued use of Iodine and its salts?

Q.—What symptoms are indicated by the term Iodism?

They may be catarrhal, nervous, or cachectic. The catarrhal symptoms resemble those of an ordinary cold in the head, accompanied by a rise in temperature, headache, sore throat, hoarseness, and dryness of the fauces. The nervous symptoms include tinnitus aurium, convulsive movements, palpitation of the heart, and impairment of the intellect. The cachectic symptoms are those of rapid emaciation, with atrophy of the mammæ or testes, followed by insomnia, hysteria, melancholia, and general mental decay. The susceptibility varies greatly in different persons, and these symptoms may in a great measure be prevented by copious draughts of water frequently taken during the course of treatment.

Q.—What is the antidote to Iodine?

Starch, with the object of forming Iodized starch, which should be evacuated from the stomach, and followed by opium and demulcents.

Q.—What are the physiological effects of Iodine?

Iodine is disinfectant, antiseptic and irritant, also vesicant if used in quantity. The iodides stimulate the lymphatic system, and cause the absorption of newly formed tissues and diseased cells. When too long continued they cause great emaciation and depression of the vital powers.

Q.—How are Iodine and its compounds eliminated from the system?

They are rapidly eliminated by the mucous membranes (irritating them in their passage) salivary glands and kidneys.

Q.—How is Iodine administered internally?

Rarely in the form of the tincture. The compound solution should be used, or the iodide of amyl.

Q.—What are the internal uses of Iodine?

As an alterative in scrofula, chronic enlargement of the joints and in exophthalmic goitre. Compound solution of Iodine is a German specific for typhoid. In the form of a vapor, Iodine is an excellent inhalation in coryza, catarrh, hay asthma and chronic bronchitis.

Q.—What are the external uses of Iodine?

As a counter irritant, alterative and resolvent application in acute affections of the pharnyx and larynx, inflammatory swellings, glandular enlargements, and as an injection in hydrocele, empyema, hydrothorax, and in ovarian and other forms of cystic degeneration.

Q.—What is the action of the Iodides on the system?

They act as alteratives, promoting the absorption of morbid products, reducing glandular enlargements and inflammatory swellings, and causing the elimination of metallic poisons.

Q.—What are the therapeutic uses of the Iodides?

In subacute rheumatism and chronic gout, and in the intervals between attacks of summer catarrh and hay asthma. In tertiary syphilis; in chronic pleurisy and pericarditis, and for the elimination of the metals from the system, especially lead, silver and mercury.

Q.—What are the incompatibles with Iodine and the Iodides?

The Iodides with the acids and acidulous salts, with the soluble metallic salts generally, with most of the alkaloids and with sweet spirits of nitre. Iodine is precipitated from the tincture on the addition of water.

Q.—What preparations of Iodine are used in Dental practice?

Tinctura Iodi, *Tincture of Iodine.*
Liquor Iodi Compositus, *Compound Solution of Iodine.*
Tinctura Iodi Decolorata, *Decolorized Tincture of Iodine.*
Liquor Iodi Phenolatus, *Carbolized Iodine Solution.*
Potassii Iodidum, *Iodide of Potassium.*
Zinci Iodidum, *Iodide of Zinc.*
Iodoform.
Iodol.
Aristol.

Q.—What is meant by the Dental tincture of Iodine?

It is a tincture four times the strength of the official.

Q.—How is the tincture of Iodine decolorized?

By the addition of a small quantity of ammonia water followed by a few drops of carbolic acid, or by combination with hyposulphite of sodium.

Q.—What are the Dental uses of Iodine?

Iodine and its preparations are valuable agents in dental therapeusis. As a counter irritant, stimulant and absorbent the tinctures are serviceable in pericementitis, alveolar abscess, mercurial and other forms of stomatitis, inflammation and ulcerations of the gums, fungous growths of gum and pulp, necrosed and suppurating tissues, diseases of the antrum and caries of the maxillary bones, dentigerous cysts, recession of gums and absorption of alveolar processes. In the treatment of these diseases also, its antiseptic and disinfectant properties play no small part.

Q.—How is Iodine best exhibited in the different forms of stomatitis?

The tincture in the form of a gargle.

Q.—How is it used in cases of alveolar abscess?

The tincture is diluted, or combined with carbolic acid, glycerin or other agents.

Q.—For fungous growths how is it used?

Alone, or combined with carbolic acid, or alcohol.

Q.—For ulcerations of the gums and mucous membrane how is it used?

The tincture combined with carbolic acid is used, also the crystals of Iodide of Potassium are sometimes placed within the pockets and the free Iodine eliminated by electrolysis. This is a favorite treatment by some in pyorrhœa alveolaris.

As an application in cases of pericementitis how is Iodine used?

The tincture combined with equal parts of the tincture of aconite root and painted on the gum with a camel's-hair pencil. Some prefer to apply the tincture of aconite first and the Iodine afterwards.

Q.—What is the effect of this application?

It relieves the inflammation by retarding the circulation and stimulating lymphatic action.

Q.—How should it be applied?

The gum should be previously dried and after application, the mouth should be kept open and the part protected until a metallic pellicle is formed.

Q.—How does a combination of Iodine and Creasote or Carbolic acid act in necrosed or suppurating tissues?

It stimulates debilitated parts and destroys such as are too weak to be restored.

Q.—Of what service is the Iodide of Potassium to the Dental practitioner?

It is used internally in mercurial stomatitis, dental exostosis, facial neuralgia, convulsions of dentition, pericementitis, looseness of the teeth, tumefaction and sponginess of the gums, syphilitic and scrofulous ulcerations of the mouth, caries and necrosis of the bones.

Q.—If the tincture of Iodine is applied to a pulp canal in which a broach has been broken, what is the result?

The Iodine will in a few days so dissolve the fine steel as to render its removal easy.

Q.—What caution is necessary in the application of tincture of Iodine to a pulp canal?

If the root possesses a crown the Iodine will stain it.

Q.—How can the stain be removed?

By applying first alcohol, then water of ammonia.

Q.—In cleaning teeth, of what service is tincture of Iodine?

When teeth are covered with green tartar, if they are first dried and then painted with tincture of Iodine, the removal of the stain will be easy by powdered pumice moistened with H_2O_2.

Q.—For what purpose is the Iodide of Zinc used?

As a stimulant and antiseptic in cases of pyorrhœa alveolaris.

Give formulæ containing Iodine and its preparations.

For Loose Teeth and Puffy Gums.

℞	Acidi Tannici,	ʒiss
	Potassii Iodidi,	gr. xij
	Tinct. Iodi,	
	Tinct. Myrrhæ,	āā ʒj
	Aquæ Rosæ, q. s. ad.	℥vj

M. Dissolve the Tannic Acid and the Pot. Iod. in the rose water, to this add the tinctures, and strain.

Signa: Use as a lotion diluted with three or four parts of water.

For Acute Pericementitis (First Stages) or for Pain in Tooth After Filling.

℞	Tinct. Aconit. Rad.	℥j
	Creasoti (pure wood),	
	Tinct. Iodi,	
	Spts. Camphoræ,	āā ʒss

M. et. Signa: Apply two or three drops around neck of tooth.

(STEVENS.)

For Ulceration of the Gums.

℞	Tinct. Iodi,	♏xlv
	Acid. Carbolici,	♏vj
	Glycerini,	℥j
	Aquæ Destillatæ,	℥v

M. Signa: Apply as a lotion. (GORGAS.)

For Pericementitis.

℞	Tinct. Aconiti Rad.	
	Tinct. Iodi,	āā ʒij

M. et Signa: Paint the gum after drying it.

(For other formulæ see Gorgas' Dental Medicine.)

HYDRARGYRUM—Mercury. Sym.=Hg.

Q.—What is Mercury?

Mercury is a metal, liquid at ordinary temperature, and obtained principally from the native sulphide, or cinnabar.

Q.—By what other name is Mercury known?

Quicksilver; Hydrargyrum being a Græco-Latin word meaning silver water.

Q.—What are the physical properties of Mercury?

Mercury is liquid above −39.5°F. Boils at 660°F. Soluble in diluted nitric acid and hot sulphuric; insoluble in hydrochloric acid. Dissolves all metals but iron; combines directly with halogens and sulphur.

Q.—What salts of Mercury are of the greatest medical importance?

The chlorides.

Q.—What are the preparations of Mercury.

Hydrargyrum cum Creta, *Mercury with Chalk*, Gray Powder, dose gr. ss–x
Massa Hydrargyri, *Blue Pill*, dose gr. ss–xv

Each grain contains gr. ⅓ of Mercury with Liquorice, Althæa, Glycerin and Honey of Rose.

Unguentum Hydrargyri, *Blue Ointment* (Mercury, Lard, Suet. Benzoin.)

Hydrargyri Chloridum Corrosivum, *Bicnloride*, *Mercuric Chloride*, *Corrosive Sublimate*. Dose gr. $\frac{1}{30}$–$\frac{1}{10}$; soluble in 16 parts of water.

Hydrargyri Chloridum Mite, *Mild Chloride*, *Subchloride*. *Mercurous Chloride*, *Calomel*. Dose gr. $\frac{1}{10}$–x; insoluble in water or alcohol.

Hydrargyri Subsulphas Flavus, *Yellow Subsulphate*, *Turpeth Mineral*. Dose gr. ij–vj as an emetic; insoluble in water or alcohol.

Hydrargyri Oxidum Flavum, *Yellow Oxide*. Dose gr. $\frac{1}{30}$–$\frac{1}{10}$.

Hydrargyri Oxidum Flavum, *Red Precipitate* Strength 10 per cent.

Hydrargyri Iodidum Viride, *Green Iodide*, *Protiodide*. Dose gr. $\frac{1}{10}$–⅓.

Hydrargyri Iodidum Rubri, *Red Iodide Biniodide*. Dose gr. $\frac{1}{30}$–$\frac{1}{10}$.

Hydrargyri Cyanidum. Dose gr. $\frac{1}{100}$–$\frac{1}{10}$.

Hydrargyri Sulphidum Rubrum, *Cinnabar*, when it occurs as an ore, and *Vermilion* when made artificially. Used only in the arts.

Unguentum Hydrarygri Nitratis, *Citrine Ointment;* (Mercury 7, Nitric Acid 17, Lard Oil 76.)

Other ointments and washes are made with Mercury.

Q.—What substances are incompatible with the salts of Mercury.

Almost every thing. Calomel with the metallic preparations, chlorides, hydrochloric and nitro-hydrochloric acids, which are apt to form with them corrosive sublimate. Also with the alkalies, their carbonates, alkaline earths, soap and the hydrosulphates. Corrosive sublimate is decomposed by nearly everything, and green mercurous iodide is converted into the more active red mercuric iodide by combination with iodine and other iodides.

Q—What are the symptoms and treatment of poisoning by corrosive sublimate?

The symptoms are violent gastro-enteritis with vomiting and purging, bloody stools, abdominal pain and tenderness, albuminous urine and death from collapse. The treatment consists in (1) giving an antidote, albumen is the best. (White of eggs, milk or wheat flower;) (2) giving an emetic, and (3) the free use of opiates and demulcents.

Give the chemical formulæ for calomel and corrosive sublimate.

Calomel, or mercur*ous* chloride Hg_2Cl_2, corrosive sublimate, or mercur*ic* chloride $HgCl_2$.

Q.—What are the physiological effects of Mercury?

Metallic Mercury is inert either internally or applied to the skin, but if allowed to remain too long in the alimentary canal or after long contact with the skin, it often becomes converted into an oxide, and produces constitutional effects. When inhaled in a state of vapor it frequently causes salivation, ulceration of the mouth, necrosis and wasting; or in other cases loss of memory, vertigo, shaking palsy and other nervous symptoms. In small doses, not too frequently repeated, mercurial salts are blood tonics, increasing the number of red corpuscles and improving nutrition. They promote waste by stimulating the lymphatic system, and in very small doses are sedative to the mucous membranes. In medium doses they have a cathartic action, and increase the flow of the bile by reflex action on the bile ducts. In full doses, continued, they over-stimulate the glands, especially the pancreas producing pathological secretions, impair the ozonizing functions of the blood, diminishing the red corpuscles, and produce a low inflammation in the nervous tissues, resulting in loss of co-ordinating power. Corrosive sublimate, in small doses, retards and prevents hyperplasia of the connective tissue, and causes, in large doses, inflammation and ulceration of the lower bowel. Locally applied it proves rapidly destructive to germs being the most efficient of antiseptics. The red iodide and the cyanide are irritant poisons.

Salivation (ptyalism) is produced most readily by blue mass, next by calomel, and least so by mercury with chalk.

Q.—What are the therapeutic uses of Calomel?

As an efficient purgative in biliousness and hepatic torpor, in doses of from one to five grains; in small doses, gr. $\frac{1}{20}$, it diminishes glandular enlargements and acts as an antiphlogistic in acute inflammation of serous membranes. It relieves congestion in dysentery and asiatic cholera; it has also been used as a specific in typhus and typhoid fever.

Q.—For what is Corrosive Sublimate used?

Externally as a germicide, parasiticide in skin diseases, and as an antiseptic dressing in the strength of one part to 2,000 of water. Internally it is used in croup, diphtheria and syphilis.

Q.—What effects follow the ingestion of Mercury in large doses?

The breath becomes fetid, the tongue swollen, the gums spongy and soft, the parotid and submaxillary glands are enlarged, and excessive salivation is produced; the teeth may be loosened and fall out, the soft portions of the mouth be ulcerated and the maxillary bones necrosed. Emaciation takes place rapidly, and the extremities may be covered with ulcers.

Q.—What is the composition of Gray Powder?

Mercury 38 parts; sugar of milk 12; chalk 50; with alcohol and ether to make a uniform gray powder.

Q.—What is its dose?

Gr. ss–x.

Q.—For what is it used?

Chiefly in diarrhea and dysentery of children, to remove offending material from the intestines, and for subduing the enlargement of the parotid and sublingual glands to which children are subject.

Q.—What are the ingredients of Blue Mass?

Mercury 33 parts; liquorice 5; althea 25; glycerin 2, and mel rosæ 34 parts.

Q.—How much Mercury is there in each grain of Blue Mass?

One-third of a grain.

Q.—For what are the Green and Red Iodide of Mercury used?

In the treatment of tertiary syphilis.

Q.—What is the difference in their chemical composition?

The red or biniodide, HgI_2, is much more active than the green or protiodide, Hg_2I_2.

Q.—For what are the Red and Yellow Oxides used?

Mostly in ointments and dusting powders as stimulants to ulcers, chancres, etc.

Q.—What is White Precipitate?

Mercur-Ammonium Chloride, and is made by precipitating a solution of mercuric chloride with water of ammonia. For external use.

Q.—What is Turpeth Mineral?

Yellow sulphate of Mercury, and is made by adding mercuric sulphate to boiling water.

Q.—For what is it used?

Rarely used now, but at one time as an alterative in doses gr. $\frac{1}{10}$–$\frac{1}{4}$, and as an emetic in croup, in doses of gr. ij.

Q.—What is Black Wash?

The results of adding gr. xxx of calomel to f℥x of lime water. A local application.

Q.—What is Yellow Wash?

The result of adding gr. xviij of corrosive Sublimate to f℥x of lime water. External use.

Q.—What are the Dental uses of Mercury?

Refined metallic Mercury is used by Dentists in the preparation of Amalgams. The mild chloride for its antiphlogistic, laxative or cathartic effects, and the corrosive chloride as an antiseptic, germicide or disinfectant, according to the proportions of the solutions used. The sulphide to color dental rubbers, and Mercury with chalk in the diarrhea of children. (The solution of the bichloride, being the most important to Dentists, and standing at the head of our list of antiseptics will be fully noticed under that head).

AURUM—Gold. SYM.=Au.

Q.—What is Gold?

A metallic element. Atomic weight 106; sp. gr. 19.26; Fusing point about 2016°, forming a green fluid which volatilizes at a higher temperature.

Q.—In what agents is gold soluble?

In Aqua Regia, a mixture of nitric and hydrochloric acids.

Q.—What series of salts are formed with Gold?

Two; Aurous and Auric.

Q.—What preparations of gold are used in medicine?

Auri et Sodii Chloridum, *Chloride of Gold and Sodium*,	dose gr. $\frac{1}{20}$–$\frac{1}{10}$.
Auri Chloridum, *Chloride of gold* (not official),	dose gr. $\frac{1}{30}$–$\frac{1}{15}$.

Q.—What are its antagonists and incompatibles?

Eggs, albumen, milk and flour are the chemical antidotes. Evacuation of the stomach, and treatment the same as for Hydrarg. Chlor. Corr.

Q.—What are the physiological actions of the Salts of Gold?

They resemble the results of Mercury closely. In small doses they promote appetite and digestion, stimulate the cerebral functions, and produce a marked mental exhilaration, a sense of well being. Continued, they induce aphrodisiac effects in both sexes, and in women increase the menstrual flow. Full doses cause nausea and vomiting, glandular irritation, salivation without loosened teeth and sore gums, increased urine, sweats and fever; nutrition is impaired and rapid waste set up. Toxic doses produce effects similar to those of corrosive sublimate, violent gastro-enteritis, mental disturbance, convulsions, priapism, trembling and paralysis. Locally the Chloride of Gold is caustic in its action.

Q.—What are the therapeutic uses of the Salts of Gold?

They are used as substitutes for corrosive sublimate in the treatment of tertiary syphilis; as alteratives in scrofula, chronic Bright's disease, myelitis, chronic ovarian inflammations and neuralgia, and as aphrodisiacs in functional impotence. Recently these salts have been employed in the treatment of inebriety.

Q.—What are the Dental uses of these Salts?

Very meagre. The Auric chloride is an escharotic and disinfectant, and dissolved in ether is used in dentistry as an obtunding agent. The metal itself is used in the laboratory and operating room.

COLCHICUM—Meadow Saffron.

Q.—What is Colchicum?

Colchicum is the corn and seed of *Colchicum autumnale* or meadow saffron (Nat. Ord. Melanthaceæ.)

Q.—What does it contain?

An alkaloid, *Colchicine* (converted into *Colchicein* by acids), Tannic and Gallic acids, starch, sugar and a resin.

Q.—What are the preparations of Colchicum?

Preparations from both the root and seed are official.

From the Root.

Extractum Colchici Radicis,	dose gr. ss–ij
Extractum Colchici Radicis Fluidum,	dose ♏ij–iv
Vinum Colchici Radicis (40 per cent.)	dose ♏v–fʒss

From the Seed.

Extractum Colchici Seminis Fluidum,	dose ♏ij–v
Tinctura Colchici (15 per cent.),	dose ♏v–fʒj
Vinum Colchici Seminis (15 per cent.),	dose ♏x–fʒj
Colchicina, Colchicine (unofficial),	dose gr. $\frac{1}{100}$–$\frac{1}{60}$

Q.—What is the antidote to Colchicum?

Tannic acid, Morphine hypodermatically to sustain the heart.

Q.—What are the physiological actions of Colchicum?

Locally applied it is irritant; internally, in small doses, it increases the secretions generally, particularly the urine, increasing greatly the amount of urea and uric acid eliminated; in large doses it causes nausea and vomiting, frequent purging, and depression of the heart's action; in toxic doses it acts as an irritant poison, producing violent vomiting and purging, great depression, collapse and death by failure of respiration.

Q.—What are the therapeutic uses of Colchicum?

Colchicum is used as an alterative and diuretic in acute gout, and in rheumatism. As a diuretic in ascites and other varieties of dropsy, and as a cholagogue in congestions of the portal circulation.

Q.—What are the Dental uses of Colchicum?

In dental disturbances from a gouty or rheumatic diathesis the exhibition of Colchicum is sometimes followed by good results.

GUAIACUM—Lignum Vitæ.

Q.—What is Guaiacum?

Guaiacum is the heart wood of *Guaiacum officinale,* a West India tree (Nat. Ord. Zygophyllaceæ).

Q.—What does it contain?

It contains from 60 to 80 per cent. of Resin (Guaiaci Resina) which consists of 3 acids, *Guaiaconic, Guaiarec, Guaiacic;* also 4 Sub-resins, and a yellow coloring matter.

Q.—What are the preparations of Guaiacum?

Guaiaci Lignum (Used in decoction)	
Guaiaci Resina,	dose gr. v–xx in pill
Tinctura Guaiaci Ammoniata,	dose ♏v–fʒss
Tinctura Guaiaci,	dose ♏x–fʒj

Q.—What are the physiological actions of Guaiacum?

Diaphoretic, expectorant and alterative. Its very unpleasant taste limits its use in medicine.

For what has it been used?

As alteratives in syphilis and chronic rheumatism, as an emmenagogue in amenorrhœa and congestive dysmenorrhœa and in tonsillitis.

STILLINGIA—Queen's Root.

Q.—What is Stillingia?

It is the root of *Stillingia Sylvatica*, an indigenous plant (Nat. Ord. Euphorbiaceæ).

Q.—What does it contain?

A resin and a volatile oil; the active principle has not yet been isolated.

Q.—What are the preparations of Stillingia?

Extractum Stillingiæ Fluidum,	dose ♏x–fʒj
Unofficial.	
Ex. Stillingiæ Fl. Comp.,	dose fʒj–ij
Syrupus Stillingiæ, Comp.,	dose fʒj–f℥j
Tinctura Stillingiæ, 10 per cent.,	dose fʒss–j
Decoctum Stillingiæ, 1 to 16,	dose f℥j–ij

Q.—What are the physiological actions of Stillingia?

Expectorant, diaphoretic, diuretic, purgative, cholagogue, sialogogue and alterative.

Q.—What are the therapeutical uses of Stillingia?

As an alterative in syphilitic affections and scrofulous tendencies, and as a hepatic stimulant in torpor of the liver hemorrhoids, and habitual constipation.

SANGUINARIA—Blood Root.

Q.—What is Sanguinaria?

It is the rhizome of *Sanguinaria Canadensis* (Nat. Ord. Papaveraceæ).

Q.—In what form is it found in commerce?

In long reddish brown pieces, having an orange red hue internally, and exuding when fresh a reddish juice.

Q.—What are its active principles?

Sanguinarina; also *Puccine* and *Porhyroxine.*

Q.—What are its preparations?

Tinctura Sanguinariæ,	dose ♏v–fʒss
Acetum Sanguinariæ,	dose ♏v–fʒss
Extractum Sanguinariæ Fluidum,	dose ♏ij–xx

Q.—What are the physiological actions of Sanguinaria?

It acts as a depressing emetic, causing nausea and prostration with feebleness of the circulation.

Q.—What are its therapeutic uses?

Principally as an expectorant in acute bronchitis and in chronic nasal catarrh; an emmenagogue in functional amenorrhœa, and in the form of a powder as an escharotic to destroy nasal growths.

XANTHOXYLUM—Prickly Ash.

Q.—What is Xanthoxylum?

The bark of *Xanthoxylum fraxineum* (Nat. Ord. Rutaceæ.)

Q.—What does it contain?

An alkaloid, *Xanthoxyline* (identical with berberine), a volatile and a fixed oil, gum, resin, etc.

Q.—What are its preparations?

Extractum Xanthoxyli Fluidum,	dose ♏x–ʒij

Q.—What are its physiological actions?

The taste of Xanthoxylum is aromatic, soon becoming acrid and bitter. It is a local and systemic sialogogue, causing profuse salivation, with tingling of the tongue and increased secretion from stomach, intestines, liver and pancreas. It is also diaphoretic and diuretic, increases the action of the heart and raises arterial tension.

Q.—What are its therapeutic uses?

Xanthoxylum is a domestic remedy for toothache in the form of an infusion, as a gargle in chronic pharyngitis, in catarrhal jaundice and rheumatism. In paralysis of the tongue it is of service.

MEZEREUM—Mezereon.

Q.—What is Mezereon?

The bark of *Daphne Mezereum*, a European shrub (Nat. Ord. Thymelaceæ.)

Q.—What does it contain?

A glucoside, *Daphnin*, also a resin, a volatile oil, etc.

Q.—What are its preparations?

Extractum Mezerei Fluidum,	dose ♏v-xxx
Extractum Mezerei (externally.)	
Unguentum Mezerei (local use.)	

Q.—What are its physiological actions?

It is a sialogue, and in small doses laxative and alterative. Locally it is an irritant.

Q.—For what is it used?

The ointment is used as a stimulating dressing to indolent ulcers. The drug is too irritant for internal use.

BERBERBIS—Barberry.

Q.—What is Berberis?

It is the root of *Berberis Aquifolium*, the Oregon grape (Nat. Ord. Berberidaceæ) indigenous to the Pacific slope.

Q.—What does it contain?

Its activity is due to its alkaloid *berberine*, found also in several other plants.

Q.—What are its preparations?

(*All unofficial*).

Extractum Berberidis Fluidum,	dose ♏v–xxx
Tinctura Berberidis,	dose ♏x–f℥j
Berberina (usually occurs in commerce as a Hydrochlorate, prepared from Hydrastis and called "Hydrastin"),	dose gr. j–x

Q.—What are the physiological actions of Berberis?

It is an astringent bitter, and in small doses a tonic and stomachic, in large doses cathartic. It is generally considered to have a high degree of alterative power. The alkaloid is astringent and antiseptic.

Q.—For what is it used?

In the treatment of blood diseases, dyspepsia, hepatic disorders, habitual constipation, and skin diseases dependent upon unhealthy secretions or conditions of the digestive tract. The Hydrochlorate of Berberine is used as an astringent and antiseptic in gonorrhœa.

FUCUS VESICULOSUS—Sea-wrack.

Q.—What is Fucus Vesiculosus?

A perennial plant of the order Algæ and grows as a sea-weed along the coast.

Q.—What is it commonly called?

Bladder-wrack, or sea-wrack.

Q.—What does it contain.

Mucilage, soda and iodine.

Q.—For what is it principally used?

To produce the absorption of adipose tissue, an extract being largely sold as a remedy for obesity under the name of "Anti-fat."

SARSAPARILLA—Smilax.

Q.—What is Sarsaparilla?

The root of *Smilax officinalis* (Nat. Ord. Smilaceæ), a vine growing in Honduras, Brazil, etc.

Q.—What does it contain?

It contains a principle *Smilacin*, or *Parallin*, from which is derived another *Parigenin*, also an essential oil, calcium oxalate, starch, resin, etc.

Q.—What are its preparations?

Extractum Sarsaparillæ Fluidum,	dose ʒss–ij
Extractum Sarsaparillæ Compositum Fluidum	dose ʒss–j
Decoctum Sarsaparillæ Compositum,	f℥j–iv
Syrupus Sarsaparillæ Compositus,	dose fʒss–iv
Extractum Sarsaparillæ,	dose gr. v–xxx

Q.—What are the physiological actions of Sarsaparilla?

Negative results have followed the most careful experiments with this drug and its principles. It probably has no activity, though by some it is considered to be an efficient diaphoretic, diuretic, tonic and alterative.

Q.—For what is it used in medicine?

Principally as a vehicle for the administration of bichloride of mercury and iodide of potassium in syphilis and scrofulous diseases.

ASTRINGENTS.

Q.—What are Astringents?

Drugs which contract (*astringere*, to bind together) tissues with which the come in contact.

Q.—How do they act?

By a direct local action?

Q.—Into what two classes are they divided?

Vegetable and mineral.

Q.—On what do the virtues of the Vegetable Astringents depend?

On the presence of tannic acid in some form.

Q.—For what are Astringents used in medicine?

To overcome relaxation from whatever cause arising, to check excessive secretions, and to stop hemorrhage under certain circumstances.

Q.—How do Astringents stop hemorrhage?

By coagulating albumen and thus forming a clot.

Q.—What term is then applied to them?

They are said to be styptics.

Q.—What caution should be observed in the employment of Astringents?

Their prolonged or continued use may give rise to inflammation.

Q.—In what cases of excessive secretion is their employment contra-indicated?

Where the secretion is the outcome of high inflammation, *e. g.* in the outpouring of serum which arises from colitis or enterocolitis.

Q.—On what tissue is the action of Astringents principally manifested?

The alimentary tract, mucous membranes, and the organs to which they can be carried directly.

Q.—What agents are usually classed as Astringents?

Tannic and Gallic Acids.
Cerium.
Lead.
Zinc.
Silver.
Alum.
Cadmium.
Copper.

Q.—Name the Vegetable Astringents?

Tannic acid, gallic acid, nut-galls, catechu, kino, krameria, hæmatoxylon, white oak, geranium, witch hazel, red and white rose, sumach, chestnut leaves.

Q.—Name the mineral Astringents?

Most of the metallic salts possess astringent properties, but those especially used for this purpose are the lead salts, alum, aluminum sulphate, the salts of copper, of zinc, of silver, and of bismuth and oxalate of cerium.

TANNIC AND GALLIC ACIDS.

Q.—What is the difference between Tannic and Gallic Acid?

According to some authorities the difference is one of oxidation; Tannic Acid when oxidized being converted into Gallic Acid. According to others the difference is one of hydration. Tannic Acid is the more powerful as an astringent. It coagulates albumen and gelatin, while Gallic Acid does not. It is, however, converted into Gallic Acid in the stomach before absorption.

Q.—From what is Tannic Acid obtained?

It is obtained from the galls of the Dyer's oak (*Quercus Lusitanica*), by treatment with ether.

Q.—From what is Gallic Acid obtained?

From the same galls, after exposure in a warm place for a month; or from tannic acid by the action of dilute sulphuric acid.

Q.—What are the physical appearances of Tannic Acid?

It occurs in light yellowish feathery scales, having a faint, peculiar odor, and a bitter astringent taste.

Q.—In what is it soluble?

In water and in glycerin, somewhat in dilute alcohol and ether.

Q.—What varieties of Tannic Acid are there?

Two; Gallo-Tannic acid, and Kino-Tannic Acid.

Q.—How are they distinguished chemically?

Gallo-Tannic makes a bluish-black color, and Kino-Tannic a greenish-black, with the salts of iron.

Q.—How is Tannic Acid prepared?

Powdered nut-galls are exposed to a damp atmosphere for twenty-four hours, and then mixed with sufficient washed ether to form a paste. After six hours this mixture is powerfully expressed and the expressed liquid evaporated on glass plates.

Q.—What reaction has Tannic Acid?

It is strongly acid.

Q.—What class of substances does it form with bases?

Tannates.

Q.—With what substances is Tannic Acid incompatible.

With the salts of iron, causing a black coloration. With the vegetable alkaloids, tartar emetic, acetate of lead, throwing down whitish precipitates.

Q.—What effect has Tannic Acid on albumen?

It coagulates it.

Q.—What is the physiological action of Tannic Acid?

On unbroken skin Tannic Acid has no effect, on raw surfaces and mucous membranes it is a powerful astringent and irritant. Taken into the stomach, it coagulates albumen, precipitates the peptones, and impairs digestion. On the intestinal tract it acts as an astringent, stopping secretion and causing constipation.

Q.—What would be the effect of throwing Tannic Acid into a vein?

It would coagulate the albumen and form a thrombus.

Q.—How do you account for the injection of a small quantity not being fatal?

In these cases a tannate of albumen is formed and this is held in solution by the alkaline carbonates of the blood.

Q.—In what way is Tannic Acid used?

Mainly as a local application.

Q.—What are its principal local uses?

(1) To tone up relaxed membranes, as in sore throat, elongated uvula, and prolapsed hæmorrhoids, etc.; (2) to check excessive secretions of the lachrymal, salivary and perspiratory glands; (3) to arrest discharges from the ear, nose, pharnyx, intestinal tract, vagina and uterus, and from old abscesses; (4) to stop hemorrhage when its source can be reached directly; (5) to harden exposed surfaces, as in sore nipples and tender feet; and (6) in certain skin diseases, as eczema and impetigo characterized by the discharge of purulent matter.

Q.—In what form can these applications be made?

As a solution in glycerin, as a gargle or spray with water, or mixed with olive or theobroma oil in the form of suppositories.

Q.—What is the strength of Glycerite of Tannin?

Two troy ounces of Tannic Acid to half a pint of glycerin.

Q.—To what is Tannic Acid an antidote?

Chiefly to tartar emetic. It is also generally antidotal to the poisonous alkaloids.

Q.—What preparations of Tannic Acid are official?

Acidum Tannicum, *Tannic Acid*, *Gallo-Tannic Acid*, *Tannin*, Dose gr. j–x

Unguentum Acidi Tannici (10–90 Benzoinated Lard).

Trochisci Acidi Tannici (Tannic Acid gr. j, Sugar, Tragacanth and Orange Flower Water).

Styptic Collodion (Tannic Acid 20, Alcohol 5, Stronger Ether 20, Collodion 55 parts).

Q.—What is Collodion?

A solution of four parts of pyroxylin in seventy parts of stronger ether, and twenty-six parts of alcohol.

Q.—How is Pyroxylin prepared?

By the action of nitric and sulphuric acids on gun cotton.

Q.—What is Gun Cotton?

It is cotton freed from all impurities, and steeped in a mixture of nitric and sulphuric acids.

Q.—What are the physical properties of Gallic Acid?

It is a white, silky substance, occurring in fine acicular crystals of a slightly acid astringent taste.

Q.—In what is Gallic Acid soluble?

In a hundred parts of cold and three parts of boiling water. Freely soluble in alcohol and in ether.

Q.—How does Gallic Acid differ, physically, from Tannic Acid?

Gallic Acid is distinctly crystalline, while Tannic Acid is amorphous.

Q.—What is the physiological action of Gallic Acid?

It is an astringent similar to but less powerful than Tannic Acid?

Q.—What considerations influence us in the choice between Gallic and Tannic Acids?

For local uses Tannic Acid is to be preferred owing to its greater strength; when, however, the part has to be reached through the circulation, Gallic Acid is preferable because it does not coagulate albumen.

Q.—In what diseases is Gallic Acid used?

In hæmoptysis, hæmaturia, and the hemorrhagic diathesis; in the profuse expectoration of phthisis, bronchorrhœa and chronic bronchial catarrh; in pyelitis, chronic diarrhea and colliquative sweats, etc.

Q.—With what is Gallic Acid incompatible?

Lime water, acetate of lead, salts of iron and copper, tartar emetic, alkalies and their carbonates.

Q.—What are the official preparations of Gallic Acid?

Acidum Gallicum,	dose gr. x–xxx
Unguentum Acidi Gallici (1-9 Benzoinated Lard.)	

Q.—What are the Dental uses of Tannic and Gallic Acids?

Tannic Acid almost entirely takes the place of

Gallic Acid in dental practice. Tannic Acid is used as a local application in mercurial stomatitis, in hemorrhage after the extraction of teeth, and as an astringent in the different diseases of the gums and oral tissues. The glycerite of tannin is a favorite application with some to the tooth pulp, especially as a dressing after the removal of the nerve paste or arsenical application. The styptic colloid is used for its styptic and deodorizing properties, as it solidifies blood and albumen by mere contact, and can be applied directly by means of a camel's hair brush. A strong solution of tannin in alcohol is also useful as an obtundent to sensitive dentine.

Give some Dental formulæ containing Tannin.

For Inflamed and Ulcerated Gums.

℞	Acidi Tannici,	℥ij
	Tinct. Iodi,	℈iv
	Potassii Iodidi,	gr. xx
	Tinct. Myrrhæ,	℈iv
	Aquæ Rosæ,	f℥viij

M. Signa: A dessert-spoonful in a wine glass of water as a mouth wash. (GORGAS.)

For Odontalgia.

℞	Acidi Tannici,	gr. xx
	Gummi Mastichi,	gr. x
	Spt. Æther. Sulph.,	f℥ss

M. Signa: Apply on cotton. (DRUITT.)

For Alveolar Hemorrhage.

℞	Acidi Tannici,	gr. xl
	Liq. Plumb. Subacet. dilut.,	f℥iss
	Vini Opii,	f℥ss

M. Signa: Apply on cotton or as an injection. (GORGAS.)

(For other formulæ see Gorgas Dent. Med.)

GALLA—Nut-Gall.

Q.—What are Galls?

Vegetable excrescences found on various species of the oak, formed by the deposition in the bark of the eggs of a fly, the Cynips Tinctoria.

Q.—How many varieties are there?

Two; the blue and the white.

Q.—Which is the most valuable?

The blue.

Q.—What are the Galls used for in pharmacy?

As the source of Tannic acid.

Q.—What preparations are official?

Tinctura Gallæ,	dose ʒss–ij
Unguentum Gallæ (1-9 *Benzoinated Lard*).	

CATECHU.

Q.—What is Catechu?

An extract from the wood of an East Indian tree, the *Acacia Catechu.*

Q.—How is it prepared?

The tree is cut down and boiled, and the liquid strained off and crystallized.

Q.—How is it found in commerce?

In small irregular fragments of a dull, reddish-brown color, and an astringent sweetish taste.

Q.—What other name does it go by?

Tanners call it "Kutch." It has also been known as "Terra Japonica."

Q.—On what does its value depend?

The presence of kino-tannic acid and catechuic acid.

Q.—What are the uses of Catechu in medicine?

It is a powerful astringent, and used extensively in diarrhea and dysentery.

Q.—What preparations are recognized?

Tinctura Catechu Composita (Catechu 12, Cinnamon 8, diluted Alcohol to make 100 parts),	dose ♏x–fʒj
Trochisci Catechu,	gr. j each.

KINO.

Q.—What is Kino?

The inspissated juice of the *Pterocarpus Marsupium* (Nat. Ord. Leguminosæ.)

Q.—On what does its virtues depend?

On Kino-tannic acid.

Q.—How many varities of Kino are there?

Five are known. The East India Kino is the most common.

Q.—What are its uses?

It is a powerful astringent, and is much used in the treatment of diarrhea and other discharges, and as a local application to indolent ulcers, etc.

Q.—What are its preparations?

Pulv. Kino,	dose gr. x–xxx
Tinctura Kino (1–10),	dose fʒj

KRAMERIA—Rhatany.

Q.—What is Krameria?

The root of the *Krameria Triandra* (Nat. Ord. Polygalaceæ) a small shrub growing in Peru.

Q.—On what does its value depend?

Kino-tannic acid.

Q.—How is Krameria used in medicine?

As an astringent, but is never given in powder

Q.—In what form is it given?

Chiefly as the tincture.

Q.—What are its preparations?

Extractum Krameriæ,	dose gr. v-x
Tinctura Krameriæ,	dose ♏v-fʒj
Extractum Krameriæ Fluidum,	dose ♏v-fʒss

Q.—What are its Dental uses?

The tincture, as an astringent, is valuable in ulcerated and spongy gums, an infusion in inflamed mucous membranes, and the powder and tincture in spongy and bleeding gums. The powder has also been used as an ingredient of dentifrices.

Formula for Inflamed Gums.

℞ Pulv. Krameriæ,		
Pulv. Cinnamomi,	āā	ʒj
Aquæ Bullientis,		f℥vij
Macerate for two hours, Add		
Sacchari,		℥ij
Ft. Gargarysma.		

Signa: To be used several times daily. (Bowen.)

QUERCUS ALBA—White-Oak.

Q.—What is Quercus Alba?

The inner bark of the white oak.

Q.—On what does its virtue depend?

On Gallo-tannic acid.

Q.—How is it employed in medicine?

Generally as an astringent wash.

Q.—What are its preparations?

None are official; used mostly in the form of decoction.

Q—What other agents (of minor importance to the Dental practice) are classed as vegetable astringents?

Hæmatoxylon, or *Logwood*.
Geranium, or *Cranesbill*.
Rosa Gallica, or *Red Rose*.
Rubus, or *Blackberry*.
Castanea, or *Chestnut*.
Granatum, or *Pomegranate*.
Rhus Glabra, or *Sumach*.
Hamamelis, or *Witch-hazel*.

HAMAMELIS—Witch-Hazel.

Q.—What is Hamamelis?

The leaves of *Hamamelis Virginica* (Nat. Ord. Hamamelaceæ).

Q.—Upon what does its virtue depend?

On Tannic acid and a bitter principle which has not yet been isolated.

Q—What are its physiological actions?

These are not well understood, and authors are at variance, some ascribing entirely negative results. It is an astringent, however, and seems to contract the veins of the skin and mucous membranes.

Q.—For what is it used?

In passive hemorrhages as a hæmostatic, as an astringent enema in hemorrhoids, and locally in congestions and inflammations.

Q.—What preparation is official?

Extractum Hamamelidis Fluidum. dose f℥ss–j

(Pond's Extract, so generally and familiarly known, is a preparation of this agent.)

Q.—What are its Dental uses?

Being applicable to all superficial inflammations, and a reliable agent in capillary hemorrhages it is a valuable agent to the dentist. As a styptic after extraction, and for bleeding and spongy gums, and also as an astringent wash in phagadenic conditions it is efficient. Some anodyne properties have also been ascribed to this agent, suggesting its employment in acute inflammations as a lotion, more effective when used as hot as can be borne.

Give formulæ.

For Recent Wounds in the Mouth.

℞	Liq. Plumbi Subacetatis,		
	Tinct. Opii,	āā	f℥j
	Ex. Hamamelidis fl.,		f℥ij
	Aquæ,		Oj
M.	Signa: Used as a lotion.		

ARGENTUM—Silver. Sym.=Ag.

Q.—What is Silver?

A metallic element, fusing point 1873° F. Soluble in nitric acid, hot strong sulphuric, and in hydrochloric acid with difficulty.

Q.—What preparations of Silver are used in medicine?

Argenti nitras, Argenti oxidum, the iodide, and the cyanide.

Q.—How many forms of Argenti Nitras are there?

Three, Argenti Nitras, Argenti Nitras Dilutus and Argenti Nitras Fusus.

Q.—Of what is Argenti Nitras Dilutus composed?

Nitrate of silver, 50 parts; nitrate of potassa, 50 parts.

Q.—How does it occur?

In pencils or cones.

Q.—In what form does Argenti Nitras Fusus come?

In cylindrical pieces.

Q.—What salt alone is used internally?

Argenti Nitras.

Q.—What is its appearance?

White, shining, rhombic plates.

Q.—In what is it soluble?

Water, nitrous acid, and nitrous ether.

Q.—What is the chemical test for Nitrate of Silver?

Hydrochloric acid throws down a heavy, white, curdy precipitate, soluble in excess of aqua ammoniæ.

Q.—What is the effect of a local application of Nitrate of Silver?

In a dilute solution it acts as an astringent, coagulating the albumen if in a stronger form; applied in its pure state it acts as a caustic, destroying the tissue and forming a whitish eschar, which subsequently turns dark.

Q.—To what is the dark color due?

To the formation of the Oxide of Silver.

Q.—What are the physiological effects of Nitrate of Silver when taken internally?

In large doses it acts as a corrosive poison, producing vomiting and purging, and powerfully affecting the nervous system, producing paralysis and convulsions, and causing death finally from cessation of respiration

Q.—What is the effect of small doses?

Small doses increase secretion of the intestinal tract, promoting nutrition and digestion, and generally speaking are tonics to the nervous system.

Q.—What effects follow the prolonged use of Nitrate of Silver?

Loss of appetite, wasting of the body, diarrhea, diminished secretion of urine, with albuminuria, and slight lowering of the body temperature. The heart's action becomes rapid and irregular. The blood becomes darker and more fluid, and ecchymoses are frequent.

Q.—What effect has Silver on epithelial structures?

It causes swelling and cloudiness of the cells, followed by fatty degenerations and destruction of the nucleus and then of the cell itself.

Q.—What is the minimum fatal dose of Silver?

Not known exactly. Thirty grains have proved fatal.

Q.—What is the antidote to Nitrate of Silver?

Common salt given in large doses to form the insoluble chloride of silver.

Q.—What are the therapeutic uses of Nitrate of Silver as a local application?

(1) As a simple caustic when only a superficial action is required, in indolent ulcers, to flabby granulation, small ulcers on the mucous membrane of the mouth, etc; (2) As a weak solution it may be applied to inflammation of the pharynx, larynx, in gonorrhœa and in conjunctivitis; (3) Strong solutions are valuable in aborting commencing inflammations, and in certain skin diseases; (4) Strong solutions are much used in granular lids, granular cervicitis, ulcerations of the cervix and endometritis, restoring a healthy tone to the tissues.

Q.—What are the internal uses of Nitrate of Silver?

For its influence on the gastro-intestinal tract, it is employed in dyspepsia, gastralgia, gastric catarrh, acid eructations of food, gastric ulcer, and in diarrheas of typhoid, phthisis, cholera infantum and dysentery (acute and chronic.) For its systemic effects on the nervous system it has been largely used in locomotor ataxia and epilepsy.

Q.—What danger attends its continued use in these diseases?

The production of a dark coloration of the skin and mucous membrane.

Q.—What is the dose of Nitrate of Silver?

Gr. ¼–j, generally in pill form.

Q.—For what is the Cyanide of Silver used?

For the preparation of hydrocyanic acid.

Q.—What are the incompatibles of Silver?

The soluble chlorides; sulphuric, sulphurous, muriatic, and tartaric acids, alkalies and their carbonates.

Q.—What are the Dental uses of Silver?

Metallic Silver is used in amalgam alloys and has also been used in dental plates. Nitrate of Silver is a valuable agent in inflamed and ulcerated conditions of the oral mucous membrane, in diseases of the antrum, and in fistula. As a styptic it has been employed; as an obtundent of sensitive dentine; and to arrest decay in teeth of children where filling is impracticable.

Q.—What is the objection to Nitrate of Silver as a styptic?

The coagulum, or clot, formed by it is soluble in an excess of albumen.

Q.—What is the objection to its use as an obtundent?

The discoloration it causes, together with the pain which follows its use.

Q.—How can this pain be relieved?

By the application of chloride of sodium.

Q.—What solution of Nitrate of Silver may be applied to the mucous membrane?

From gr. j to grs. xxx to the ℥ of water.

Q.—In what form, other than solution, is Nitrate of Silver applied?

Either in stick (lunar caustic) or by means of a silver wire dipped in nitric acid.

Give formula.

For Ulcers and Apthæ.

℞	Argenti Nitras,	ʒss
	Aquæ dest.,	℥j
M.	Signa: To be applied with a camel's-hair brush.	(Gorgas.)

CUPRUM—Copper. Sym.=Cu.

Q.—What is Copper?

A metallic element. Fusing point 1996° F.

Q.—In what is Copper soluble?

In hot mineral acids, and is attacked by vegetable acids in the presence of air and moisture.

Q.—How is pure Copper obtained?

By electrolysis; a solution of cupric sulphate is used, and the negative wire of a battery attached to a copper plate which is immersed in the solution. Pure

Copper is deposited on the plates, and may easily be stripped off.

Q.—What preparations of Copper are official?

Cupri Sulphas,	dose gr. $\frac{1}{10}$–$\frac{1}{4}$, or grs. vi–xij as an emetic.
Cupri Acetas (Local use.)	

Q.—What other name has Sulphate of Copper?

Blue Vitriol.

Q.—In what is it soluble?

Water; but not in Alcohol.

Q.—What is the physiological action of Sulphate of Copper?

In doses of from five to twelve grains, it is a simple irritant emetic. In very small doses it acts as a mere tonic and astringent to the gastro-intestinal tract. In large doses it is a violent poison.

Q.—What are its local effects?

In a dilute solution it is mildly stimulating to mucous membranes, and astringent. If applied in the form of a powder it is an irritant, and mildly caustic. Some antiseptic properties have also been ascribed to it.

Q.—For what is Sulphate of Copper used in medicine internally?

Principally as a mechanical emetic in narcotic poisoning, and for its action on the gastro-intestinal tract in acute and chronic dysentery, chronic diarrhea, and in the vomiting of pregnancy.

Q.—What are its external uses?

As an astringent, in solution, to inflamed surfaces and indolent ulcers. In the form of "blue stone" as a styptic, as an application to flabby granulations, etc., and as an ointment to some forms of skin diseases.

Q.—What is the chemical antidote to Copper poisoning?

The ferro-cyanide of potassium and albumen.

Q.—What are the uses of the Acetate of Copper?

It may be used indifferently for the Sulphate. It has no properties of its own.

Q.—What are the incompatibles of the Copper salts?

The alkalies and their carbonates, lime-water, mineral salts, and most astringent vegetables.

Q.—What is Verdigris?

An impure Acetate of Copper.

Q.—What are the Dental uses of Copper?

Copper is used in dental amalgams, both pure and as an ingredient of other alloys, in the shape of attenuated wires it is used for filling pulp canals. Sulphate of Copper, in the form of the ammonical solution is used in protracted cases of neuralgia; and externally is applied to ulcers of the mouth, cancrum oris, apthous ulcerations, hemorrhage from the gums and from leech bites, fungous growths, etc., lately it has been recommended as an application in pyorrhœa. (*Douglas, O.D. J., Vol. XII, pp. 562*).

Give formula.

For Gangrenous Ulcers of the Mouth.

℞	Cupri Sulph.,	ʒij
	Pulv. Cinchonæ,	℥ss
	Aquæ,	℥iv

M. Signa: Brush over ulcerated surfaces twice daily.

(GORGAS.)

PLUMBUM—Lead. SYM=Pb.

Q.—What is Lead?

A metallic element. Fusing point 617° F.

Q.—In what is it soluble?

In dilute nitric acid; and attacked by hot sulphuric.

Q.—What are the official preparations of Lead?

Plumbi Acetas, *Sugar of Lead*, dose gr. ¼–v
Plumbi Oxidum, *Litharge.*
Plumbi Carbonas, *White-lead Paint.*
Liquor Plumbi Subacetatis (Externally only).
Liquor Plumbi Subacetatis Dilutus, *Lead Water.* (Contains 3 per cent. of Liq. Plumbi Subacet).
Plumbi Nitras (Externally).
Plumbi Iodidum (Used as an ointment).

Q.—Into what two main classes are the salts of Lead divided?

The soluble and the insoluble.

Q.—Which are the soluble?

The acetate, iodide and nitrate.

Q.—Which are insoluble?

The carbonate and oxide.

Q.—Which salt is the most frequent cause of acute lead poisoning?

The acetate.

Q.—What are the symptoms of Lead poisoning?

A sweet, metallic taste in the mouth, with a feeling of dryness about the throat and great thirst, followed by nausea, and the vomiting of milky-white matter. (Chloride of Lead). Later violent abdominal pains and cramps ensue. Constipation or diarrhea; with dark, black stools; a blue line on the gums at the junction of the mucous membrane with the teeth, caused by a deposit of the Sulphide of Lead in the capillaries is often present very early and is characteristic of lead poisoning.

Q.—What is a fatal dose of Sugar of Lead?

Between one and two ounces.

Q.—What is the treatment of Lead poisoning?

Evacuate the stomach, and give sulphate of sodium, or magnesium, followed by opium and albuminous drinks.

Q.—How do these antidotal salts act?

They form an insoluble sulphate of Lead.

Q.—What salt is most frequently the cause of chronic Lead poisoning?

The carbonate.

Q.—What are the symptoms of chronic Lead poisoning?

Colicky pains, costive bowels and furred tongue. Thirst, sometimes extreme, and neuralgic pains. The extensor muscles of the forearm are frequently paralyzed, giving rise to the symptoms known as "wrist drop"; strabismus, and the blue line on the gum.

Q.—What effect has Lead on muscular tissues?

It destroys their structure entirely.

Q.—What precaution should be observed in giving a preparation of Lead?

The gums should be examined daily for evidences of absorption.

Q.—What are the physiologlcal effects of the Salts of Lead?

Astringency is the chief quality; they contract muscular tissues, and destroy its contractile power, also, lessening secretion, they cause colic and constipation. The heart at first increased in power is soon slowed; also the respiration. The nervous system is insidiously affected, obscure symptoms, as headache, loss of memory, vertigo, etc., being manifested.

Q.—What are the therapeutic uses of the salts of Lead?

Chiefly used as an astringent and hæmostatic, in skin diseases, catarrhal discharges, burns, hemorrhages, diarrheas, etc. Inflammation of external parts are commonly treated by the lotion of "lead, water and laudanum," though the constituents are chemically incompatible; it is a valuable sedative and astringent.

Q.—For what is the Nitrate of Lead used?

Principally for disinfectant purposes, and for the destruction of dead tissue in felons.

Q.—What are the Dental uses of Lead?

Lead alloys with other metals, and is an ingredient of various solders. It is used in the laboratory for making counter-dies, patterns for air chambers, in rubber and celluloid plates, and patterns from which gold or silver plates are cut. Cones are made from this metal for filling root canals.

Q.—For what purposes are the Oxides of Lead used?

As coloring matter for artificial teeth.

Q.—For what purposes are the Salts of Lead used in Dentistry?

To relieve superficial inflammations, arrest morbid discharges, and allay the pain of acute inflammations.

Q.—How are they used?

In solutions.

Q.—What preparation is generally used?

Liquor Plumbi Subacetatis Dilutus, commonly known as lead water.

Q.—Of what is it composed?

Liquor Plumbi Subacetatis,	fʒij
Aquæ distillatæ,	Oj

Q.—For what purpose is the nitrate sometimes used?

In dilute solution, as a wash in ozena, and to correct the fetid odor of discharges from ulcers, etc.

Give formulæ.

For Inflamed Gums After Extraction.

℞	Liq. Plumbi Subacetatis,	f℥j
	Tinct. Opii,	f℥ij
	Aquæ dest.,	f℥v

M. et Signa: Lotion and mouth-wash.

For Pericementitis.

℞	Liq. Plumbi Subacetatis,	ʒss
	Tinct. Opii,	ʒij

M. et Signa: Apply to cavity and gum.

For Ozæna or other Fetid Discharges.

℞	Plumbi Nitratis,	gr. x
	Aquæ dest.,	f℥j

Ft. Sol. et Signa: Use as a spray or lotion.

ZINCUM—Zinc. Sym.=Zn.

Q.—What is Zinc?

A metallic element; fusing point 773° F.

Q.—In what is it soluble?

In dilute acids, and in solution of alkaline hydrates; slowly corroded by water, milk, and wine.

Q.—What preparations of Zinc are official?

Zinci Oxidum,	dose gr. ¼–v
Zinci Bromidum,	dose gr. j–v
Zinci Chloridum (External use),	
Zinci Carbonas, dose gr. ss–ij; Emetic,	dose gr. x–xxx
Zinci Carbonas Precipitatus,	dose gr. ij–iij

Zinci Iodidum,	dose gr. ss–ij
Zinci Phosphidum,	dose gr. $\frac{1}{25}$–$\frac{1}{4}$
Zinci Sulphas,	dose gr. j–xx
Zinci Valerianas,	dose gr. j–ij
Unguentum Zinci Oxidum (20 per cent.)	
Liquor Zinci Chloridi (50 per cent.)	

Q.—What preparations are unofficial?

Zinci Lactas,	dose gr. ss–j
Zinci Sulpho Carbolas,	dose gr. ij–iij
Zinci Cyanidum,	dose gr. $\frac{1}{4}$–iss
Zinci Oleatum (5 per cent.)	
Unguentum Zinci Carbonas (20 per cent.)	

Q.—What salts of Zinc are insoluble in water?

The oxide, carbonate, phosphide, and cyanide. The soluble salts are usually poisonous, hence the metal should not be used for cooking utensils.

Q.—What are the physiological actions of the salts of Zinc?

The salts of Zinc are astringents, though milder than the salts of Lead. Its soluble salts (the chloride, sulphate and acetate) are corrosive poisons, causing violent gastro-enteritis, and in some cases profound nervous symptoms. The chloride is powerfully and painfully escharotic, having a great affinity for water, and destroying the albumen of the tissues. The sulphate is a specific emetic, acting promptly and without much depression, also astringent, and mildly caustic. Continued use produce symptoms similar to lead poisoning, but of less gravity.

Q.—What are the antidotes to Zinc poisoning?

Soap, lime-water, alkalies, potassium and sodium carbonate, mucilaginous drinks, eggs and milk.

Q.—What are the therapeutic uses of the salts of Zinc?

They are used as weak and mild astringents in phagedenic and catarrhal conditions, in skin diseases, diarrheas and night sweats. The valerianate as an anti-spasmodic and the chloride as an escharotic.

Q.—What are the Dental uses of Zinc?

Metallic Zinc is used in the laboratory for making dies for swaging plates, and in the form of the muriate as a flux for certain solders. Zinc has also been added to some amalgam alloys for the purpose of controlling shrinkage, imparting plasticity, and maintaining color.

Q.—What salts of Zinc are of special interest to the Dentist?

The chloride, oxide, phosphate, sulphate and iodide.

Q.—For what is the Chloride used?

As an escharotic and obtundent, astringent and styptic, and as one of the ingredients of oxy-chloride of Zinc filling.

Q.—For what is the Oxide of Zinc used?

For the treatment of convulsions of children during dentition, and combined with carbolic acid, creasote, oil of cloves, etc., to make a paste for capping exposed pulps; also as an ingredient for the Zinc filling materials, and the celluloid base for artificial teeth.

Q.—For what is the Phosphate of Zinc used?

As an ingredient of Oxy-phosphate of Zinc filling material.

Q.—For what is the Sulphate of Zinc used?

As an astringent and stimulating ingredient for application to inflamed and ulcerated surfaces, and as an ingredient of the oxy-sulphate fillings.

Q.—For what is the Iodide of Zinc used?

For its antiseptic and astringent properties in ulcerated conditions, tumors, enlargements, etc.

Give formulæ.

For Pyorrhœa Alveolaris.

℞	Zinci Iodidi,	gr. xij–xxiv
	Aquæ,	f℥j

M. Signa: After drying the gums inject each pus pocket with one, two, or three drops of this solution. (HARLAN.)

For Oxy-Phosphate of Zinc Fillings. (*Powder.*)

℞	Zinci Oxidi,	parts 200
	Silicii (Fine pow'd.)	parts viij
	Sodii Boratis,	parts iv
	Pulv. Glass,	parts v

Levigate under water, to insure complete admixture, and dry by evaporation; then calcine at a white heat; then reduce to powder.

Liquid.

℞ Acidi Phosphorici,
Aquæ, q. s. to dissolve, and evaporate the solution by aid of heat, until it is of the consistency of glycerin.

(GORGAS.)

For Oxy-Chloride of Zinc Fillings.

(Powder).

℞	Zinci Oxide,	gr. xxx
	Sodii Boratis,	gr. ij
	Silicii (fine pow'd.),	gr. j

Mix thoroughly and subject to a bright red heat in a crucible. Then grind this first to a powder, and mix it with three times its weight of calcined oxide of Zinc.

Liquid.

℞	Zinci Chloridi (deliq.),	f℥j
	Aquæ,	f℥v–vj

(GORGAS.)

For Chronic Alveolar Abscesses, Abscess of the Antrum, etc.

℞	Zinci Sulphatis,	gr. iij
	Plumbi Acetatis,	gr. v
	Tinct. Catechu,	gtt. x
	Aquæ.	f℥j

M. Signa: Use as a stimulating injection.

(PARMELE.)

(For other formulæ see Gorgas' Dent. Med.)

CADMIUM. SYM=Cd.

Q.—What is Cadmium?

A metallic element. Fusing point 442° F. Closely resembles Zinc and often found in its ores.

Q.—In what is it soluble?

In dilute hydrochloric, sulphuric and nitric acid, but not in caustic alkalies.

Q—What preparations of Cadmium are used in medicine?

None are official, but the following are used:

Cadmii Sulphas (local use).
Cadmii Iodidi (70 per cent. of Iodidi).
Cadmii Iodidi Unguentum (ʒj–℥j Lard).
Cadmii Oleas.

Q.—What is the action of these preparations?

Astringent, resembling their corresponding zinc salts, but principally employed for local effects. The sulphate is emetic.

Q.—What are the Dental uses of Cadmium and its salts?

Cadmium is added to alloys to render them more fusible, and is a constituent of some amalgam alloys. The sulphate has been used in various injections and lotions, in the strength of about gr. j to aquæ f℥iv for phagedenic conditions. It is poisonous. Percentage of Cadmium, 43.74.

CERIUM. SYM=Ce.

Q.—What is Cerium?

A metallic element. Almost infusible, never found isolated or in a metallic state.

Q.—What preparation is used in medicine?

The Oxalate.

Q.—For what is it used, and in what doses?

In cases of vomiting and cough, reflex in origin, as the vomiting of pregnancy or other uterine disturbances. Dose (if pure) gr. ij–x, in pill form.

ALUMEN—Alum.

Q.—What is Alum?

Alum is a soluble sulphate of aluminium, chromium, manganum or ferrum, with a sulphate of an alkaline metal or group (potassium, sodium, or ammonium).

Q.—What two kinds of Alum are generally known?

Potassa Alum and Ammonia Alum.

Q.—Which is official?

The former; but the latter is still sold and dispensed as alum.

Q.—How can the latter be detected?

By rubbing the specimen with lime, when the odor of ammonia will be evolved.

Q.—What are the physical properties of Alum?

It occurs in octahedral colorless crystals with an astringent, acidulous, sweetish taste.

Q.—In what is Alum soluble?

In water and boiling water, but not in alcohol.

Q.—What are the preparations of Alum?

Official.

Alumen, dose gr. x–xx (Emetic ʒj for a child)
Alumen Exsiccatum, *Dried Alum*, dose gr. x–xx
Aluminii Hydras, *Hydrate of Aluminum*, dose gr. iij–xx
Aluminii Sulphas, *Sulphate of Aluminum* (External use)

Unofficial.

Alum-Ammonio-Ferricum, *Alum Iron*, dose gr. ij–x
Alumen Glyceritum (20 per cent. Alum),
Aluminii Oleas
Aluminii Chloridi,
Aluminii Permanganas.

Q.—What is the physiological action of Alum?

Taken in the mouth it provokes an excessive flow of saliva, and coagulates the albumen and mucous of the buccal cavity, thus diminishing secretion, and, when swallowed, causing dryness of the throat and constipation. In doses of a teaspoonful it is emetic.

Q.—What are its systemic effects?

In the circulation it acts as an astringent to the blood-vessel walls, diminishing their calibre and blanching mucous membranes.

Q.—What is the effect of large doses internally

Violent gastro-enteritis, with nausea, vomiting purging and abdominal pains.

Q.—What are the local effects of Alum?

Applied locally it is a powerful astringent and irritant.

Q.—What is the objection to its continued use in the mouth or throat?

It acts destructively on the teeth.

Q.—Why has it this action?

Owing to the Sulphuric acid it contains.

Q.—What are the external uses of Alum?

Styptic and astringent.

Q.—In what cases is Alum laxative?

When there is atony or paresis of the muscular coat of the bowel.

Q.—In what is Alum considered a specific?

In painter's colic.

Q.—How does it act in this disease?

By overcoming the paralysis of the muscular coat of the intestines.

Q.—What are the internal uses of Alum?

Combined with gentian, is is of service in gastric catarrh. In intestinal hemorrhage, gastralgia, enteralgia and intestinal catarrh, it has also been used with advantage.

Q.—What is "dried," or "burned" Alum?

Alum deprived of its water of crystallization by heat.

Q.—For what is it used?

As a mild escharotic to ulcers when the granulations are exuberant.

Q.—What case of poisoning by Alum is on record?

An ounce and five drachms proved fatal in eight hours.

Q.—What are the incompatibles with Alum?

The alkalies and their carbonates, lime, magnesia, carbonate of magnesia, tartrate of potassium, and acetate of lead.

Q.—For what are the salts of Aluminium used?

For their astringent and antiseptic properties.

Q.—What are the Dental uses of Alum and its preparations?

Alum is used in Dentistry as an astringent, styptic, and, in connection with Labarraque's solution, as a bleaching agent.

Q.—When is it used as a styptic?

In alveolar hemorrhage.

Q.—When as an astringent?

In stomatitis, ulceration and sponginess of the gums, morbid or fungous growths of gum or pulp, superficial hemorrhage from mucous membranes, ulcers, odontalgia, etc.

Q.—What effect has a boiling solution of Potassa-Alum on plaster casts?

It hardens them.

Give formulæ.

For Ulcerated and Spongy Gums.

℞	Aluminis,	ʒj
	Vini,	Oj
	Tinct. Cinchonæ,	℥ss
	Tinct. Myrrhæ,	ʒij
	Mel. Rosæ,	℥ij
M.	Signa: To be used as a gargle.	

(GORGAS.)

For Inflammation and Ulceration of Mouth and Throat.

℞	Infus. Lini,	℥xv
	Tinct. Kino,	℥j
	Aluminis,	ʒij
M.	Signa: Use as a gargle.	

(GORGAS.)

ANTIPYRETICS.

Q.—What are Antipyretics?

Agents or measures which reduce the body temperature when abnormally high.

Q.—How do they act?

Either by limiting the generation of heat, or by favoring its loss through radiation, conduction, or evaporation.

Q.—How do Antipyretics lessen heat production?

By depressing the circulation and diminishing oxidation. It is probable that they possess a distinct inhibitory power over the heat-centre.

Q.—How do Antipyretics favor heat loss?

By dilating the cutaneous vascular system.

Q.—What agents limit heat production?

Alcohol, antipyrin, benzoic acid, camphor, carbolic acid, quinine, cinchonine, cinchonidine, eucalyptol, phenacetin, resorcin, salicylic acid and its combinations, thymol, berberine, chinoline, kairine, thallin, leeching, cupping, blistering and poulticing, *by diminishing tissue change*; and aconite, antimonials, digitalis, gelsemium, etc., *through the circulation.*

Q.—What agents favor heat loss?

Acetanilid, alcohol, antipyrine, nitrous ether, thalline, etc., *by increasing radiation*; antimonials, nitrous ether, opium and ipecacuanha, pilcocarpus, etc., *by dissipating heat in evaporating the perspiration;* and cold baths, cold drinks, ice to surface, cold sponging, and wet packing, *by abstracting heat from the body*.

Q.—Of the foregoing what agents remain to be noticed?

Antipyrine, acetanilid, phenacetine, benzoic acid, carbolic acid, salicylic acid, thymol, menthol, kairine, thalline, leeching, cupping, blistering, poulticing, and cold applications. (The others have been noticed under their respective headings. Some of the above, being also Antizymotics, will be noticed elsewhere.)

ANTIPYRINA—Antipyrine.

Q.—What is Antipyrine?

An alkaloidal product of the destructive distillation of coal-tar. Also prepared synthetically.

Q.—What are its physical properties?

Antipyrine occurs as a white crystalline powder, which combines with acids to form salts; somewhat bitter.

Q.—In what is it soluble?

In half its weight of hot water, and in its own weight of cold water; less soluble in alcohol, chloroform or ether.

Mention some of its tests.

It gives an intensely red color with ferric chloride, and a beautiful green with nitric acid.

Give its chemical formula and names.

$C_{11}H_{12}N_2O$, di-methyl-oxy-chinicine, being derived from the hypothetical base chinicine (or quinizine) which itself is a derivative of chinoline.

Prof. S. P. Sadtler gives the chemical formula and name of Antipyrine as follows: Phenyl-dimethyl-pyrazolon (C_6H_5) (CH_3) C_3 HN_2O. Other authors give the formula $C_{20}H_{18}N_4O_2$.

Q.—By what other name is Antipyrine known?

Methozin (Western druggist). Phenazone (B.P.)

Q.—What is the objection to the names "Antipyrine," "Antifebrin," etc.?

They are copyrighted for trade purposes and should therefore be dropped from professional use.

Q.—What are its physiological actions?

Powerfully antipyretic, local anæsthetic, and general analgesic. It also possesses some diaphoretic, mydriatic, antiseptic, hæmostatic, and slightly hypnotic powers. In ordinary doses not much effect is noticed beyond lowering of nervous irritability, and slowing of respiration, with weakened pulse and arterial tension and increased urination.

Q.—What are the symptoms of a toxic dose?

Restlessness, anxiety, slow respiration, weak pulse, and vertigo. In some patients an erythematous, measly rash, is noticed after continued use.

Q.—How may this rash be removed?

By administering belladonna with it, or by a hypodermatic injection of atropine.

Q.—How is poisoning by Antipyrine treated?

By diffusible stimulants, heart tonics and artificial respiration or inhalation of oxygen.

Q.—What is the dose of Antipyrine?

The full dose for an adult is put at gr. xxx hourly for three hours. For children, gr. j for each year of age, to be repeated twice, or for three successive hourly doses.

Q.—What effect has Antipyrine on the blood?

The blood color is altered, which according to Lepine, is the result of the production of methæmoglobin in the blood. The same author denies the destruction of the red blood corpuscles, and shows by counting that the blood contained before, during, and after Antipyrine intoxication, the same number of red blood corpuscles.

Q.—What are the therapeutic uses of Antipyrine?

Its principal uses are for hyperpyrexia from any cause, acute rheumatism, neuralgia, especially when of rheumatic origin, and painful affections of hysterical persons; all of which are generally relieved with promptness.

Q.—What are the Dental uses of Antipyrine?

Hypodermatically and by the stomach, Antipyrine is efficacious in neuralgias of the fifth pair of nerves and in most painful manifestations of the oral cavity such as pericimentitis, etc. Valuable as a hæmostatic in bleeding from the gums or alveolar cavities.

Q.—In what doses is it administered?

About 15 grs. by the stomach, or 15 minims of a 100 per cent. solution hypodermatically.

Q.—With what agents is Antipyrine incompatible?

Though a fairly stable body, it is more or less decomposed, or thrown out of solution by a number of other chemical compounds and galenicals, a fact of importance when dealing with mixtures of which it forms an ingredient. A great many agents fall into this list, the most important being:

Acid Hydrocyanici.
Butyl-Chloral Hydras.
Dec. Cinchonæ.
Ext. Cinchonæ Fld.
Ferric Salts, in solution.
Nitrites, in solution.
All acids.
Tinctures containing Tannin or Iron.
Acid Tannici.
Chloral Hydras (in strong solution).
Ferri Sulph.
Inf. Catechu Com.
Sodii Salicylas (solid).
Tinct. Iodi.
Tinct. Hamamelidis,

(HELBING.)

Q.—What is the objection to its hypodermatic use?
The intense pain which lasts for a few moments.

Q.—How can this be controlled?

By conjoining with it some salt of cocaine and carbolic acid, or by injecting the cocaine just prior to the antipyrine.

Formulæ:

℞	Antipyrinæ,	gr. lxxx
	Elixir Aurantii,	f℥iv

M. (Each ʒ contains about grs. ijss.)
A pleasant mixture for children.

For Congestive Headache.

℞	Antipyrinæ,	gr. xv
	Potas. Brom.,	℈j
	Tinct. Aconiti fol.,	♏v
	Aq. Chloroformi,	āā f℥i

M. Signa: One dose.

For Immediate Removal of Dental Pulp.

℞	Cocaini Hydrochloratis	
	Antipyrinæ,	āā gr. xx
	Acidi Carbolici,	gtt. x
	Aquæ dest.,	f℥j

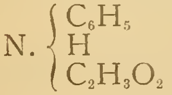
M. Signa: Apply to pulps with force by hypodermatic syringe.
(McCoy.)

ACETANILIDUM—Acetanilid.

Q.—What is Acetanilid?

A derivative of Anilin, from which it is obtained by the action thereon of glacial acetic acid, substituting the organic radical Acetyle for an atom of hydrogen.

Q.—What is its chemical formula and name?



$$N.\begin{cases} C_6H_5 \\ H \\ C_2H_3O_2 \end{cases}$$

Phenyl Acetamide.

Q.—By what copyrighted name is this drug known?
Antifebrin.

Q.—What are its physical properties?

White crystalline powder, neutral reaction, odorless, with slight burning taste.

Q.—In what is it soluble?

Freely soluble in alcohol, wine, etc., but very sparingly in water.

Q.—What is the dose of Acetanilid?

The dose ranges from gr. ij to xv, repeated twice, but not exceeding gr. xxx in the 24 hours; ʒj has been swallowed without ill effects while gr. xv in divided doses have produced death.

Q.—What are the physiological effects of Acetanilid?

Antipyretic and strongly analgesic and antispasmodic, lessening the reflex action of the spinal cord, and inhibiting the sensibility of the sensory nerves. It raises the arterial tension somewhat, and slows the heart in corresponding degree.

Q.—How does the action of Acetanilid compare with that of Antipyrine?

As an antipyretic it is slower, but its effects last longer. It is markedly diuretic, somewhat diaphoretic; is a cerebral muscular and vaso-motor stimulant and leaves no ill after effects; while Antipyrine is powerfully diaphoretic, a cerebral sedative, and produces great depression. The dose is smaller.

Q.—What is the effect of a toxic dose?

It destroys the ozonizing function of the blood, forming methæmoglobin.

Q.—What is the danger from the use of Acetanilide?

There is a tendency, in some few cases, to collapse, with chills and cyanosis, especially the latter, during the period of depressed temperature.

Q.—What conditions caution us against its use?

In patients suffering from fatty or dilated heart, it should only be used with caution, if at all.

Q.—What fact renders this agent of value in acute inflammation?

The fact of its being quickly diffused into the blood and the nutritive qualities of the red-blood corpuscles being changed, the hæmoglobin converted into methæmoglobin, the consumption of the hydrocarbons is diminished, and all their agents act as protoplasmic poisons.

Q.—What are the therapeutic uses of Acetanilid?

Almost the same as for antipyrine. With the advantage, however, of its smaller dose, marked analgesic and antispasmodic powers, combined with safety and the absence of tendency to produce collapse, and to be followed by depression. Its effects upon the weak heart, however, decide against its use in some cases.

Q.—What are the Dental uses of Acetanilid?

In some respects similar to those of antipyrine; to Acetanilid, however, may be ascribed curative as well as palliative powers. No hæmostatic virtues have been given it but antiseptic qualities have been spoken of. In threatened pericemental troubles, either alone, or in combination with lupulin, it is found valuable. Also in cases of chronic alveolar abscess, and in diseases of the antrum, either alone, or alternated with calx sulphurata, it has rendered assistance.

Give formulæ.

For Pericementitis Accompanied with Pain.

℞	Acetanilid,		
	Lupulin,	āā	ʒj

M. et. ft. Capsulæ No. xij

Signa: One Capsule every two or three hours.

For Febrile Spasmodic and Painful Disturbances of Children.

℞	Acetanilidi.	gr. xxx
	Alcoholis,	fʒiij
	Glycerini,	fʒij
	Aquæ Cinnam,	fʒiij
	Syr. Tolutani,	f℥j

M. Signa: One to three teaspoonfuls every two or three hours.

(LOVE.)

For Neuralgia or Inflammation.

℞	Acetanilidi,		ʒj
	Sp. Vini Gallici		℥ivss
	Syr. Simp.,		
	Aquæ,	āā	ʒvj

M. Each tablespoonful contains about five grains.

PHENACETINE—Phenacetine.

Q.—What is Phenacetine?

Phenacetine is a coal-tar product, analogous in composition to acetanilid.

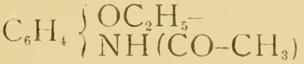
Q.—What are its physical properties?

A white crystalline powder, slightly bitter taste, without odor.

Q.—In what is it soluble?

Alcohol, glycerin, lactic acid, and sparingly in water.

Q.—What is its chemical formula and name?



$$C_6H_4 \left\{ \begin{matrix} OC_2H_5- \\ NH(CO-CH_3) \end{matrix} \right.$$

Para-acetphenitidin.

Q.—What advantages are claimed for Phenacetine over antipyrine and acetanilid?

It is not toxic in ordinary doses, and does not appear to be followed by dangerous depression, while it is efficient and tasteless.

Q.—In what class of patients are these results from Phenacetine mostly negative?

In those cases where the stomach is deficient in lactic acid.

Q.—How is Phenacetine supposed to act?

By being slowly dissolved in the lactic acid of the stomach it reaches the circulation, where it proves to be, not a narcotic, but an analgesic and antipyretic. The mode of action is probably through the central nervous system, that of the vaso-motor nerves more especially, for Phenacetine acts especially on vaso-motor neuroses, which, with its diaphoretic powers indicates great effect in the circulatory system.

Q.—What is the dose of Phenacetine?

Grs. viij–xx (as an Antineuralgic.)
Grs. ij–viij (as an Antipyretic.)

Q.—What are its therapeutic uses?

The same as antipyrine or acetanilid, combining the virtues of both without their ill effects.

Q.—What are its Dental uses?

When the condition of the heart would forbid the two former, Phenacetine is used; it is more rapid in its action, and far less dangerous.

Give formulæ.

℞ Phenacetine,
Lupulin, āā ʒj
M. et ft. Capsulæ, No. x–ij
Signa: One or two capsules every two or three hours.

Pericementitis.

℞ Phenacetine, ʒj
Ft. Cht. No. 4–5.
Signa: One powder every two hours till relieved.

For Neuralgia, Rheumatism, or Insomnia.

℞ Phenacetine, ʒiv
Glycerini,
Elix. Erythroxyli, āā f℥iij
M. Signa: One or two teaspoonfuls every one or two hours.

CHINOLINA—Chinoline.

Q.—What is Chinoline? C_9H_7N.

Also called *Lencoline*, is a constituent of coal-tar; obtained also from quinine or cinchonine by their destructive distillation with potassium hydrate, and may be artificially prepared from anilin or nitro-benzol.

Q.—What are its physical characteristics?

A colorless, oily liquid, strongly refractive, boiling at 460° F. without decomposition, turns dark on exposure to air.

Q.—In what is it soluble?

In alcohol, ether, and carbon disulphide, sparingly so in water. It combines with acids to form salts, all of which, except the tartrate, are very deliquescent.

Q.—What preparations are used in medicine?

Chinolinæ Tartras (unofficial), dose gr. v–xx

Q.—What are its physiological actions?

Antiseptic and antipyretic, closely resembling quinine in its action, but of very disagreable taste and odor.

Q.—What are its therapeutic uses?

Has been used in typhoid fever, acute rheumatism, and erysipelas, typhus, diphtheria, etc., with varying success. Some benefit has been claimed in neuralgic affections. Is most interesting as the base of other compounds.

KAIRINA—Kairine.

Q.—What is Kairine?

It is the hydrochlorate of an artificial alkaloidal substance prepared from chinoline. (Unofficial.)

Q.—What is its chemical name and formula?

Hydrochlorate of Oxy-ethyl-chinoline hydride, with the formula $C_{10}H_{13}NO–HCl, H_2O$.

Q.—What are its physical properties?

A white crystalline powder, freely soluble in water, but is best administered in wafer or capsule.

Q.—What is its dose?

Gr. iij–xxx, as an antipyretic, grs. viij, hourly for four doses, or until 100° F. is reached.

Q.—What are its physiological actions?

A powerful antipyretic, producing profuse sweating and vomiting. In some cases it has caused cyanosis and collapse, but has not yet proven fatal. It stains the urine a deep green color. By many authorities considered the most powerful and most rapid antipyretic, but has been almost supplanted by antipyrine. (No longer manufactured.)

THALLINA—Thalline.

Q.—What is Thalline?

A synthetically prepared alkaloid, prepared from the hypothetical base Chinoline.

Q.—By what other name is it known?

Parachinanisol.

Q.—What is its chemical name?

Tetra-hydro-paramethyl-oxy-chinoline.

Q.—What are its physical properties?

A colorless powder, soluble in water, and enters into combination with acids, forming salts, of which the tartrate and sulphate are the most eligible, especially the latter.

Q.—What is the dose?

From gr. ij–xv, about five grains being an average dose. Given in compressed tablets.

Q.—What are its physiological actions and uses?

An antipyretic of great power, but as the agent produces profuse sweating and a dangerous depression, it is not a favorite remedy for hyperpyrexia. (Unofficial.) The base itself is not used in medicine, only the tartrate and sulphate, and even with these, experiments have not encouraged their use. They are poisonous to the red-blood corpuscles and to the nervous system.

MECHANICAL ANTIPYRETICS.

Q.—What Mechanical agents are used for their Antipyretic effects?

Leeching, Cupping, Massage, Blistering and Poulticing.

Q.—What is a Leech?

The Leech (Hirudo) is an annulated aquatic worm, with a flattened body, tapering toward each end and terminating in circular flattened disks.

Q.—What two varieties of leeches are used?

The European *hirudo medicinalis*, termed also *sanguisuga officinalis*, and the American *hirudo decora*.

Q.—What is the difference between the two?

The European is of a blackish or grayish-green color on the back, from two to three or four inches in length, and is characterized by six longitudinal dorsal ferruginous stripes, the four latter ones being interrupted or tesselated with black spots. It draws about f℥ss. The American is usually from two to three inches long, of a deep green color, with three longitudinal dorsal rows, or square spots. The latter makes a smaller incision, and is preferable in infantile cases. It draws about f℥j.

Q.—What is the effect of Leeching?

When applied between the inflamed area and the heart, the blood current is accelerated, stasis removed or prevented, as is also the migration of cells and the effusion of serum.

Scarifications produce the same results in a less degree and also gives vent to effused fluids.

Q.—What is meant by Cupping?

The removal of atmospheric pressure by tne application of glasses partially exhausted of air, producing a determination of blood to the capillaries of a part which is afterward drawn by scarification.

Q.—How many kinds of Cupping are recognized?

Two. "Dry-Cupping," when blood is not abstracted, and "Wet-Cupping," when the scarificator is used.

Q.—In what class of cases is preference given to each of these methods of depletion?

Leeches are employed in external inflammations, while cupping is preferable in internal, from their more decided revulsive influence.

Q.—What precautions are given as to Leeching?

As Leech-bites make scars, they should be cautiously applied over an exposed part, as the female face; or over a superficial vessel or nerve, over the seat of morbid action, or in the vicinity of locally infective wounds, as venereal ulcer, etc.

Q.—What is meant by Massage?

A system of treatment by which the body is subjected to a series of manipulations.

Q.—How is Massage divided?

Into general and local.

Q.—How are the movements of general Massage classified?

1st. Effleurage, or stroking.
2d. Petrissage, or kneading.
3d. Tapotement, or percussion.

Q.—How should the strokes of Massage generally be directed?

From the periphery towards the centre.

Q.—What is the theory in regard to Massage?

By an indirect, or reflex action these processes are believed to have a very distinct effect upon the capillary circulation; they mechanically loosen agglutinated muscular fibres and by stimulating the local circulation promote absorption of exudation.

Q.—For what is General Massage usually employed?

For various neurasthenic conditions to remove local congestion, and to relieve spinal anemia.

Q.—For what purposes is Local Massage usually employed?

For dispersing exudations and the agglutinated tissues, and for the relief of glandular enlargements and to dilate lymphatic channels.

Q.—In what conditions can this system be advantageously employed by the Dentist?

In all stages of inflammation *after the first*, in local paralysis, and in some cases of neuralgia, or rheumatic manifestations, tumors, etc.

Q.—What measures and agents are synergistic to the action of Massage?

Electricity, a liberal and nutritious diet, baths, and certain tonic drugs which are used to promote constructive metamorphoses.

Q.—What are Blisters?

Also called Epispasties and Vesicants, are agents, which when applied to the skin, produce inflammation, accompanied by effusion of serum beneath the cuticle.

Q.—For what purposes is this class of agents employed?

1st. As local stimulants in the case of internal inflammations. 2nd. To substitute a healthy therapeutic inflammatory action, which subsides spontaneously, for a morbid action existing in the part to which they are applied. 3d. To relieve pain which they do partly by a substitutive influence. 4th. To break down a train of morbid association by a powerful impression on the nervous system. 5th. To stimulate the absorbing or secreting vessels of parts contiguous to the seat of their application. 6th. As general stimulants. 7th. As local stimulants, in threatened gangrene, paralysis, etc. 8th. As evacuants, for the purpose of local depletion. 9th. In gout. 10th. To prepare a surface for the endermic application of medicines. (BIDDLE.)

Q.—What agents are used as Vesicants?

Acetic acid (Glacial).
Cantharides (Sol. plast. etc.).
Euphorbium.
Rhus toxicodendron.
Heat.

Q.—What are Poultices?

Also called Cataplasms, are soft applications of bread, meal, etc., medicated or not, for the conveyance of heat and moisture.

Q.—How do they act?

In the early stages of inflammation they lessen the amount of blood at the seat of morbid action, by dilating the cutaneous vessels, and prevent stasis and the migration of white corpuscles; after stasis has taken place and migration has commenced, they favor the formation of pus.

Q.—What objection is there to the application of a poultice to the face in cases of alveolar abscess?

Expulsion of pus would be attracted through the cheek, forming a cicatrix, that might prove disfiguring.

Q.—In what cases is the application of cold beneficial?

In cases of hyperpyrexia, acute inflammatory affections, hemorrhage, congestion, and in traumatic delirium.

Q.—How is cold usually applied?

As a bath, affusion, sponging, wet pack, ice to surface, cold drinks and enemata.

ANTIZYMOTICS.

Q.—What are Antizymotic drugs?

Drugs which arrest or inhibit the fermentative processes, either by destroying, or by rendering inactive the causative ferments.

Q.—What is fermentation?

Fermentation is a general name for certain processes of decomposition, during which certain carbon compounds called ferments act upon other carbon compounds, or on their food, splitting these latter up, setting free their elementary constituents, and thereby leading to the formation of still other carbon compounds, by the rearrangement of the freed molecules.

(POTTER.)

Another definition:—

Fermentation is the decomposition of carbohydrates into simpler compounds by the agency of living microbes.

(MITCHELL.)

Q.—How are the processes of fermentation divided?

Into two kinds. 1st, those in which water is taken up (hydration), chiefly carried on by enzymes. 2d, those in which O is transferred from the H to the C association, as in lactic and alcoholic fermentation, and the putrifactive processes, and are chiefly carried on by the agency of organized ferments.

Q.—How are ferments divided?

Into two groups, viz: *Enzymes*, or *Organic Ferments*, and *Organized Ferments*.

Q.—What are Enzymes, or Organic Ferments?

Agencies which have no definite structure, and are unorganized; *i. e.*, not living, as Diastase, Ptyalin, Pepsin, etc.

Q. What are Organized Ferments?

Minute, living organisms; as the yeast plant, bacteria, etc.

Q.—From what class of plant-life are these agents derived?

From the Protophytes, the lowermost class, which in the course of their life history split up the carbon compounds in which they live, appropriating some part of their elements.

Q.—What are Parasiticides?

Agents which destroy the various animal and vegetable organisms which live upon the human body.

Q.—How are Parasites divided?

Into Ecto and Endo-parasites, according as they live on, or within their hosts.

Q.—How are Antizymotics usually divided?

Into two general groups; Antiseptics and disinfectants.

Q.—What other term is used in connection with these agents?

The term Germicides.

Q.—What are Antiseptics?

Those agents which prevent, or retard septic decomposition by destroying the activity of the infectious matter, the chemical composition of the body still, in many cases, remaining the same.

Q.—What are Disinfectants?

Agents which decompose and remove the infectious matter itself.

Q.—How do Disinfectants act?

By several modes; some as *oxidizants*, as lime, chlorine, iodine, bromine, heat, etc. Others as *desulphurants*, as ferric sulphate, lime, etc., and others as *absorbents*. Some unite with the hydrogen of the effusive body, others oxidize the gas or vapor, others remove water and coagulate albumen, others by chemical combination form suhstitution compounds, others arrest molecular changes and still others alter the reaction of the media containing the germ.

Q.—What are Germicides?

Agents which possess the power of killing germs.

Q.—What are Leucocytes?

White blood-corpucles.

Q.—What are Phagocytes?

One or more leucocytes united for combined action.

Q.—What is their function?

According to Metschnikoff, it is to destroy the bacteria which find their way into the circulation and permeate the tissues.

Q.—What are Deodorants?

Agents which destroy foul odors, belong principally to this class of disinfectants.

Q.—What are the principal disinfectants?

Bromine, chlorine, iodine, charcoal, chlorinated lime, chlorinated soda, iron sulphate, potassium permanganate, heat, sulphurous acid gas, nitrous acid gas, mercuric chloride, aluminum, chlorine, zinc chloride, carbolic acid, potassium bichromate, csmic acid, zinc sulphate.

Q.—What are the Chief Antiseptics?

Mercuric-chloride, iodide and oxide, potassium permanganate, potassium chlorate, sulphurous acid, sulphites and hyposulphites, sulpho-carbolates, zinc chloride, carbolic acid, creasote, alcohol, eucalyptol, quinine, salicin, thymol, borate of sodium, napthol, napthalin, hydronaphthol, anilin, antipyrine, arsenic, benzoin, boric acid, chinoline, copper sulphate, hydroquinon, iodoform, iodol, aristol, myrtol, kairin, oxygen and peroxide of hydrogen, pyrodin, resorcin, saccharin, salicylates, salol; sulphides, terpinol, oil of mustard, picric acid, chloroform, some essential oils, as cajeput, cassia, cinnamon, cloves, eugenol, etc., aseptol, menthol, sanitas oil, listerine hydrochloric acid, sodium carbonate, creolin, guaiacol sodium-silico-fluoride, phenol sodique, nitrate of silver and quite a number more of newer agents, which with some of the above will be noticed under the head of " New Remedies."

NOTE.—The list of Antiseptics, Antipyretic, etc., is getting so voluminous; and growing so rapidly, and many of the newer agents are so intimately connected in the different classes, as to render it difficult, if not impossible, to make any scientific arrangement.

Q.—What are the principal Parasiticides?

The several combinations of mercury, sulphur and Iodine, carbolic acid, etc.

Q.—Why do some of the antiseptics and disinfectants mentioned above, appear in both tables?

Because they are either one or the other, or both, according to the strength in which they are used.

Q.—What antiseptics, disinfectants and deodorants are principally used in Dental practice?

Bichloride of mercury, peroxide of hydrogen, carbolic acid, creasote, permanganate of potassium, iodoform, iodol, aristol, alcohol, chloroform, phenol sodique, listerine, eucalyptol, eugenol, terpinol, thymol, zinc chloride, iodine, aromatic sulphuric acid, nitrate of silver, salol, boric acid, borax, hydronapthol, chloride of lime, soda, etc., salicylic acid, oil of cassia, sanitas oil, guaiacol, sodium-silico-fluoride, sodium carbonate, etc.

BICHLORIDE OF MERCURY.

Q.—How does Bichloride of Mercury class with other antiseptics?

It is considered the most powerful medicinal agent.

Q.—In what form is it used?

In solution, varying from 1 to 5000 to 1 in 500, an average being about 1 in 2000.

Q.—What are the principal objections to its use?

It is a powerful poison, it coagulates albumen, and corrodes metallic instruments.

Q.—What are the physical properties of Mercuric Chloride?

Heavy colorless crystals, of acrid, metallic taste. acid reaction. soluble in 16 parts of cold water, and two of boiling, about two of alcohol and four of ether.

Q.—How does the antiseptic powers of Bichloride of Mercury compare with those of Carbolic Acid?

Experiments tend to show that the Bichloride of Mercury is about 200 times as powerful as Carbolic Acid.

Q.—What would be the proper proportions for a 1 to 2000 Solution?

As a fluid ounce of water at 60° F. weighs about 456 grains in apothecaries' weight, the proportions would be about 1 grain to 4½ ounces.

Q.—What combination is recommended by Dr. Black as an injection to pus pockets and alveolar abscesses?

Hydrogen Dioxide,	f℥j
Mercuric Chloride,	gr. ij

Q.—What would be the proportions of this solution?

About 1 to 225, or a little less than ½ per cent.

(NOTE.) Such a strength as this should always be confined to small abscess-pockets, and even then used with great care. (BLACK.)

Q.—What is Dr. Miller's opinion of the comparative value of mercury, benzoin and salicylic acids, and listerine?

He says: "Of the four which are available for the prophylactic treatment of the oral cavity, particularly of the teeth, the bichloride is, without doubt, the most effective, because its action continues longer."

Q.—What is the internal dose of mercuric chloride?

From $\frac{1}{30}$ to $\frac{1}{10}$ of a grain.

Q.—Are aqueous solutions of this agent stable?

No. They gradually decompose on exposure to light, or in contact with organic substances.

Q.—What other physical objection to this agent?

Its slowness to dissolve, and its power to coagulate albumen.

Q—How may these objections be overcome?

By combining the agent with chloride of ammonium or tartaric acid.

Q.—What proportions of chloride of ammonium are used?

Equal parts; papers being kept on hand containing gr. j of each, to be dissolved in aqua ℥j when needed.

Q.—What proportions of tartaric acid are recommended by Laplace?

From 4 or 5 of the acid to 1 of the chloride in 1,000 parts of water.

Q.—What effect is produced by the acid?

It prevents the precipitation of an insoluble albuminate of mercury; increases the antiseptic powers so that weaker solutions are required; renders the solution unobjectionable when other measures are required, and makes it non-irritant.

Q.—What are the principal Dental uses of Bichloride of Mercury?

As an antiseptic, disinfectant, and germicide, it is valuable to the dentist in all pathological conditions requiring the services of this class of remedies; in alveolar abscess, pyorrhœa alveolaris, etc., and as a prophylactic, in many instances its work will be appreciated. It is employed as a lotion, injection or gargle.

(NOTE.) "Prof. W. D. Miller, in a list of remedies, with which he made careful experiments, places the relative powers of well known agents in preventing the development of fungi as follows:

Bichloride of Mercury,	1-100,000.
Peroxide of Hydrogen,	1-50,000.
Iodine,	1-6,000.
Iodoform,	1-5,000.
Salicylic Acid,	1-2,000.
Eucalyptol,	1-1,600.
Carbolic Acid,	1-1,500.
Chloride of Zinc,	1-1,250.
Permanganate of Potash,	1-100.
Listerine,	1-.120.

The same author also publishes the following table showing the strength in which Antiseptics may be used in the mouth:

Sublimate,	1-2,000.
Trichloride of Iodine,	1-2,000-1,500.
Benzoic Acid,	1-300-200.
Salicylic Acid,	1-300-250.
Hydronaphthol,	1-1,500.
B. Napthol,	1-1,500.
Peroxide of Hydrogen,	2-4-100.
Thallium Sulphur,	1-1.000.
Saccharin,	1-400.
Soluble Saccharin,	1-120.
Oil of Eucalyptus,	1-625.
Eugenol,	1-750.
Oil of Cinnamon,	1-400.

Lysol,	1-200.	Oil of Cloves,	1-550.
Carbolic Acid,	1-100.	Oil of Latch,	1-360.
Boric Acid,	1-50.	Oil of Wintergreen,	1-350.
Zinc Sulphocarbolate,	1-250.	Oil of Peppermint,	1-600.
Liq. Alumin. Acet.,	1-20.	Chlorate of Potash,	1-40.
Thymol,	1-2,000.	Permanganate of Potash,	1-2,500.
Alum. Acet. tartar,	1-60.		

"The efficacy of the sublimate was increased to a surprising degree by the addition of benzoic acid."—*Cosmos*, Vol. xxxiii, pp. 915.

HYDROGEN PEROXIDE.—H_2O_2.

Q.—What synonyms are used for this agent?

Hydrogen dioxide, hydric dioxide, or peroxide, and oxygenated water.

Q.—What is the theoretical constitution of Hydrogen Peroxide?

H_2O_2, composed of 2 atoms of hydrogen and 2 of oxygen; by weight 32 of oxygen to 2 of hydrogen, or 16 to 1, molecular weight 34. (MITCHELL.)

Q.—How is Hydrogen Peroxide prepared?

According to Thenard, Peroxide of Hydrogen may be obtained by a tedious chemical process. In a dilute form, however, it is obtained by passing a stream of carbon dioxide through water containing barium dioxide in suspension.

Q.—By whom was this agent discovered?

By Thenard, in 1818.

Q.—What are its physical properties?

Probably never quite free from water, in its purest state it is a syrupy, colorless liquid, having an odor like chlorine or ozone with a tingling metallic taste.

Q.—Is Peroxide ever used in its pure, undulated state as a medicinal agent?

No. Owing to the facility with which it decomposes and gives off its oxygen.

Q.—How is it customary to designate the strength of the several solutions of Peroxide?

By the volumes of oxygen which the particular solution is capable of yielding.

Q.—How many volumes of oxygen will be yielded by the pure Peroxide?

Four hundred and seventy-five times its own volume.

Q.—What is the average strength of the commercial solutions of Peroxide?

From 10 to 20 volumes. 15 volumes being the most usual, or a little over three per cent.

Q.—What precautions are necessary in keeping the solutions?

They are very unstable, and should be kept in a cool, dark place, and in glass stoppered bottles which should be small.

Q.—What is meant by the letters C. P. found upon bottles of Peroxide in the pharmacy?

That the *solution* is chemically pure, (freed from impurities) and not that the bottle contains chemically *pure* Peroxide of Hydrogen.

Q.—How are the solutions of H_2O_2 rendered more stable?

By slightly acidulating them.

What acids are used by Marchand for this purpose?

Hydrochloric $\frac{1}{3000}$ and Phosphoric $\frac{1}{5000}$.

Q.—Does an excess of acid effect the usefulness of the solution?

Yes, it renders it irritant.

Q.—What two preparations of H_2O_2 are in use?

The Medicinal and the Technical; the latter usually has a strong acid reaction.

Q.—What is Glycozone?

The trade name of a substance similar to Hydrogen Peroxide in which glycerin is the vehicle.

Q.—What tests for H_2O_2 are suggested by Mayr?

Bits of paper saturated with a mixed solution of iodide of potash and dithionate of soda. One drop of a 12 volume solution produces a blue spot in twenty seconds; of a 6 volume, in from one to two minutes; of a 4 volume, no blue spot is produced, only possibly a blue rim.

Q.—What is the dose of a 15 volume solution?

From one to three teaspoonfuls three times a day.

Q.—What are the physiological actions of H_2O_2?

In medicinal solution it is a destructive oxidizer, hence a powerful antiseptic. According to Marchand, when brought into contact with any diseased surface, either of the skin or mucous membranes, its decomposition takes place immediately and at first "ozone," the result of this reaction, is given off, coagulating the albuminoid matter of the secretions, destroying pus and bacteria. It arrests immediately and definitely all fermentation due to an organized ferment; the soluble ferments, however, do not seem to be affected by it.

Q.—What is Ozone?

Condensed oxygen, O_3, or (O_2+O).

Q.—What are the therapeutic uses of H_2O_2?

It is employed as an internal remedy in fevers, pertussis, consumption, diphtheria, dyspepsia, catarrh of the stomach, etc. Locally as an antiseptic and disinfectant in abscesses, ulcers, carbuncles, wounds, both fresh and putrid, ozæna, diphtheria, etc., and as a base for most bleaching preparations.

Q.—What are its Dental uses?

Owing to its pus-destroying and cleansing properties, conjoined with its non-toxic effects, it is valuable to the dentist in the treatment of alveolar and other abscesses, pyorrhœa alveolaris, inflammation and ulceration of the oral mucous membrane, etc., and as a bleaching agent in restoring discolored teeth.

Q.—Give formulæ containing H_2O_2.

Black.

℞ Hydrogen dioxide, f℥j
Mercuric Chloride, gr. ij
Ft. Sol. et Signa;: To be used as an injection in alveolar abscess and pyorrhœa alveolaris. (To be used with caution.)

℞ Hydrogen dioxide, f℥j.
Acidi Borici, qs. ad. Sat.
Signa: An Antiseptic lotion or injection.

ACIDUM CARBOLICUM.

Q.—Give the synonyms of Carbolic Acid.

Phenol, Phenylic Alcohol, Phenic Acid.

Q.—What is Carbolic Acid?

It is an alcoholic product of the distillation of coal-tar between the temperatures of 302° F. and 374° F.

Q.—How is the official Carbolic Acid obtained?

By distilling the Crude Carbolic Acid between 338° and 365° F., separating from other products, and purifying by repeated crystallization.

Q.—By whom was it discovered?

By Runger, in 1834, who gave it the name Carbolic Acid. In 1841, Laurent more fully investigated and found it was the Hydrated oxide of Phenyl, and gave it that name.

Q.—Is this substance, strictly speaking, an acid?

No. It is an alcohol. It will not redden litmus, being neutral in reaction. It is called "Acid" because it readily combines with bases forming carbolates, or phenates, so-called. Formula C_6H_5HO.

Q.—Is Carbolic Acid obtained from other sources than that described?

It is recently claimed to have been prepared by synthesis, but the process has not been made public.

Q.—What advantages are claimed for the Synthetic?

That it is a perfectly pure Carbolic Acid, almost inodorous, less toxic, and more soluble in water.

Q.—Has the synthetic product any advantage as an Antiseptic?

Experiments so far do not prove the fact.

Q.—What are the physical properties of Carbolic Acid?

When pure, it is colorless, but becomes tinged with red on exposure to light, in acicular-crystals, or crystalline masses, with a characteristic taste and odor, with neutral reaction. Fusible at 95° F., boiling at 368° F.

Q.—In what is it soluble?

Very sparingly soluble in water (5 per cent. or 95 per cent.), readily soluble in alcohol and ether, chloroform, glycerin and essential oils. By the addition of 5 per cent. of alcohol or glycerine to the crystals they remain liquified.

Q.—What are the preparations of Carbolic Acid?

Acidum Carbolicum, dose gr· ss–ij
(Of liquefied.) ♏ i–ij
Unguentum Acidi Carbolici (10 per cent.)
Sodii Sulpho carbolas, dose gr. v–xxx
(Unofficial.)
Glyceritum Acidi Carbolici (25 per cent.)
Aqua Acidi Carbolici, (ʒij–in Oj) dose fʒj–ij
Carbasus Acidi Carbolici (*Carbolized Gauze.*)
Oleum Acidi Carbolici (1 in 20 of olive or cotton seed oil)
Suppositoria Acidi Carbolici (each containing 1 gr.)
Campho-phenique, *Carbolic Acid and Camphor.*
Liquor Sodii Carbolatus, *Phenol Sodique.*
Liquor Sodii Boratis Compositus, *Dobell's Solution.* (Borax and Sodium bicarbonate, each ℥ij, Carbolic Acid, gr. xxvi in water Oj) spray.
Tri-Brom-Phenol (a compound of Bromine with Carbolic Acid. External use.)
Calcium Carbolatum, *Carbolated Lime* (for disinfecting purposes.)

Q—What are the physiological actions, of Carbolic Acid?

Carbolic Acid and its preparations are destructive to all forms of life. It is classed as an antiseptic, antipyretic, deodorizant and disinfectant. It prevents the decomposition of albuminous fluids by bacteria, the fermentation of sugar by yeast, etc. In the usual solutions its action upon micro-organism is inhibitive rather than destructive.

Q.—What are th local effects of Carbolic Acid?

It is styptic, anaesthetic and superficially escharotic, coagulating the albumen of the part.

Q.—When swallowed undiluted, what effects are noticed?

Violent gastro-enteritis, with vomiting, followed by collapse, delirum, sometimes convulsions and death.

Q.—When applied directly to a muscle or nerve, what are its effects?

It paralyzes them at once without previous stimulation.

Q.—When absorbed how does it act?

By selection upon the medulla, especially on the respiratory and vaso-motor centres therein, which it first briefly stimulates and then completely paralyses.

Q.—How does it effect the circulation?

It depresses the heart and paralyses the vaso-motor centre.

Q.—How does it effect the respiration?

It stimulates the periphery of the vagi and at first increases it, followed by depression.

Q.—How is Carbolic Acid eliminated?

Chiefly by the urine, breath, saliva, and in all the secretions.

Q.—How is the urine affected?

It is diminished in quantity and standing, acquires a dark greenish color.

Q.—In what form is it eliminated?

As Sulphocarbolic Acid.

Q.—What is the antidote to poisoning by Carbolic Acid?

The soluble sulphates (soda or magnesia). Collapse is relieved by hypodermatic injections of atropine, by hot applications, arterial stimulants, and friction. Oils or glycerin are not permissable internally, as they favor absorption.

Q.—What are the therapeutic uses of Carbolic Acid?

Internally, to relieve nausea and vomiting, and the summer diarrhea of children. In nasal catarrh, ozæna, chronic bronchitis, pertussis, asthma, etc., it is useful in spray; and in typhoid fever, scarlet fever. etc., it is one of the many specifics.

Q.—What are the external uses?

As an antiseptic dressing for wounds, to allay itching of the skin and to correct the fetor of ill-smelling discharges. It is also employed as an injection in abscesses, carbuncles, etc.

Q.—What are the Dental uses of Carbolic Acid?

The various properties of this agent make it a valuable medicament to the dentist. It is used as an antiseptic, disinfectant, styptic, escharotic, analgesic, local anæsthetic, etc. As an obtundent for sensitive dentine, as an ingredient of arsenical paste, pulp cappings, sprays for the mouth and throat, to open abscesses and irrigate them, as a component of washes for the antrum and oral cavity, as a dressing for pulp canals, exposed pulps, and suspected dentine, and, in combination with other agents, as an application around the roots of teeth or to the gums.

Q.—What are the objections to Carbolic Acid in many cases?

Its power to coagulate albumen, its solubility in water, its lack of diffusibility, it is not a chemical disinfectant, and the short duration of its effects.

Q.—For dental purposes what grade of Carbolic Acid should be used?

None but the best and purest. For general disinfection, "Carbolic Acid No. 4," containing about 94 per cent. of pure acid, is suitable.

Q.—What solutions of Carbolic Acid are usually used as antiseptic liquids?

For spray or vapor, 5 per cent. in water.

For sponges or lotion, 2½ per cent. in water.

For special dressings, 5 per cent. in olive oil.

Q.—What is Potassium Phenate?

Sometimes called Robinson's Remedy, is equal parts of Carbolic Acid and Caustic potassa.

Q.—For what is it used in Dentistry?

As a local application in pyorrhœa alveolaris, and as an obtundent.

Q.—As a local anæsthetic, mention some cases where Carbolic Acid is valuable?

Pulp exposure, alveolar abscess, application to gum before lancing, or fitting a crown, etc. (For Phenol Sodique, see article on sodium.)

Q.—Give formulæ containing Carbolic Acid?

A lotion for soft and spongy gums:

℞ Acidi Carbolici, gr. xx
Alcoholis, fʒij
Aquæ dest., f℥vj
M. Signa: Use as a wash. (GORGAS.)

For dry mouth:

℞ Acidi Carbolici, gtt x
Glycerini, ℥j
M. Signa: Apply to palate or mouth with soft brush three times a day. (FISH.)

Lotion after extraction:

℞ Phenol Sodique, ℥j
Signa: Teaspoonful in a glass of water freely as a mouth wash
(For other formulæ, see Gorgas' Dent. Med.)

CREASOTUM—Creasote.

Q.—What is Creasote?

The product of the distillation of wood-tar.

Q.—Why was it so named?

From the Greek *Kreas*-flesh, and *sozo*, to save. So named because of its ability to preserve animal substances from decay.

Q.—By whom was it discovered?

By Reichenbach, in 1830.

Q.—Of what does it consist?

Principally of the following phenols:

Guaiacol, $C_7H_8O_2$, boiling at 392° F.

Creasol, $C_8H_{10}O_2$, boiling at 422.6° F.

Methylcreasol, $C_9H_{12}O_2$, boiling at 417° F. to 424.4° F.

Phlorol, $C_8H_{10}O$, boiling at 426.2° F.

Q.—How does the impure or coal-tar Creasote differ from the above?

By containing another group of phenols, including Carbolic acid. It contains *Phenol* C_6H_6O, boiling at

359.6° F.; *Cresylic Acid*, or *Cresol*, C_7H_8O, 388.4° F.; *Xylenol*, or *dimethyl phenol*, C_8H_{10}, 411.8° F. (Nearly all the liquid sold for Creasote is impure Carbolic acid, or coal-tar Creasote.)

Q.—From what wood is the purest Creasote obtained?

From Beech wood.

Q.—What are the most active constituents of Creasote?

Guaiacol and *Creasol*, upon which its therapeutic properties depend.

Q.—How is Creasote distinguished from Carbolic acid?

Carbolic acid by the addition of Nitric acid is converted into Picric acid, and Creasote into Oxalic acid chiefly. Creasote also will not coagulate collodion.

Q.—What percentage of Guaiacol should be present in Creasote?

From 60 to 90 per cent.

Q.—What should be the Sp. gr. of pure Creasote?

From 1.070 to 1.080.

Q.—What are the physical properties of Creasote?

Pure beech-wood Creasote is an oily liquid, nearly colorless (reddish amber), of smoky odor, caustic taste, and neutral reaction.

Q.—In what is it soluble?

In 80 parts of cold, and 12 parts of boiling water, and in all proportions of alcohol, ether, etc.

Q.—What effect has the tincture of the Chloride of Iron on alcoholic solutions of Creasote and Carbolic acid?

With the solution of Creasote it developes a deep, greenish-blue color; but with Carbolic acid a light brown.

Q.—What effect has glycerin on these two substances?

Carbolic Acid is dissolved by it. Creasote is not.

Q.—Mention some other difference between Carbolic Acid and Creasote.

Carbolic acid, when pure, is a solid; Creasote a liquid; Creasote an oil, Carbolic Acid an alcohol.

Q.—Mention a simple test for the purity of Creasote.

Drop it upon white paper when, if pure, it will, after being volatilized by heat, leave no stain.

DIFFERENTIATION.

Phenol.	*Creasote.*
1 Soluble in Commercial Glycerin.	1 Insoluble in Glycerin.
2 Precipitates Nitrocellulose from Collodion.	2 Does not precipitate Collodion.
3 Gives a brown color with ferric Chloride and Alcohol.	3 Gives a green color with ferric Chloride and Alcohol.
4 Gives a violet color with ferric Chloride and Ammonium Hydrate.	4 Gives a green color passing to brown, with ferric Chloride and Ammonium Hydrate.
5 Made from Coal-tar.	5 Made from Wood-tar.
6 An Alcohol.	6 An oil.
7 When pure, a solid.	7 Always liquid.
8 Coagulates albumen rapidly.	8 Coagulates albumen slowly.
9 Imparts a blue color to a piece of pine wood dipped first into Carbolic Acid, and then into HCl after the lapse of an hour.	9 Does not impart a blue color to a piece of pine wood dipped first into Creasote and then into HCl.

Q.—What are the official preparations.

Creasotum, dose ♏i-iij
Aqua Creasoti (1 per cent.) dose fʒss–iv
Unguentum Creasoti (unofficial), ♏xxx-℥j

Q.—What are the physiological actions of Creasote?

Creasote is a local sedative, stimulant rubifacient, escharotic, styptic and antiseptic. In large doses an acro-narcotic poison, (but does not produce convulsions like Carbolic Acid. Aulde.) Creasote does not destroy the digestive power of ptyalin, but a solution of 1 to 500 destroys yeast and bacteria, showing that it is serviceable in lessening the increase of micro-organisms in the alimentary tract, without interfering with digestion. (Wernekes.) It arrests the movements of protoplasm without apparently producing any change in it, and applied locally to healthy or diseased tissues it is anodyne, probably through its influence over the sensory nerves. (AULDE.)

Q.—How does it effect the circulation?

Moderately large doses temporarily increase it.

Q.—How does it affect the respiration?

Respiration is somewhat slower and labored.

Q.—How does it effect the renal structure?

The action of this drug is not so marked as that of Carbolic Acid. The amount of the secretion is reguly increased, but the presence of the drug is not so pronounced.

Q.—What effect has Creasote upon the oral mucous membrane?

It causes more or less salivation, with a strong, smoky taste and a burning, tingling sensation.

Q.—What effect has Creasote on the blood?

When brought into direct contact, the blood changes from a bright red to a redish brown color with spots of coagulated albumen in it and becomes thicker.

Q.—What is the treatment of poisoning by Creasote?

Similar to that from Carbolic Acid. The most approved chemical antidote is saccharinated lime, (Huseman) but oils and fats or glycerin are to be avoided. Stimulants to meet the depression, and antropine as an antagonist.

Q.—What are the therapeutic uses of Creasote?

Recently Creasote, and its derivations, have gained prominence in pulmonary affections, exhibited both by the stomach and by inhalation. It has also been used in cases of gastric irritability and vomiting, flatulent diarrhea, diabetes, haemoptysis, epilepsy, neuralgia, etc. Externally it is applied to ulcers, eruptions, diseases of the skin, wounds, hemorrhage from the wounds of leech bites, warts, etc.

Q.—What are the Dental uses of Creasote?

In dental practice, to obtain satisfactory tesults "*Beechwood Creasote, C. P.*" should be dispensed. Most authors make the statement that this agent has been almost entirely superseded by Carbolic Acid, the two having many qualities in common; some go so far as to claim that Creasote should be eliminated from the dental pharmacopœa. The objections do not seem to arise from the lack of efficiency of the medicament, but solely on account of its disagreeable and penetrating odor. This is an objection, but not uncontrollable. The two agents do possess some powers in common, but they individually also have advantages one over the other. Creasote, no doubt, will disappoint when used where Carbolic Acid is indicated, and vice versa. As a powerful and rapid coagulant Carbolic Acid has the preference, this very fact rendering Creasote preferable when such mechanical action is not desired, and less so when this protection (?) is needed. Experiments also prove that in combination with other agents prolonged analgesia is obtained with pure wood Creasote that cannot be obtained by any preparation of Creasote contaminated with the least particle of Carbolic Acid. Experiments also prove that Carbolic Acid is destructive to living tissue, while Creasote is not. Creasote will preserve dead tissue, Carbolic Acid will not, if the tissue be exposed to contaminating influences. As a styptic, there can be no comparison between the two, and as a mumifier of dental fibrillae its claim should not be disputed. A comparison of its antiseptic powers is left to the future, earnestly believing that the oil will not suffer in comparison with the alcohol. (According to Guttman, tubercle bacilli are destroyed by blood which contains ½ per mille of Creasote, while even half that proportion arrests their growth.")

Q.—In the treatment of exposed pulps how is Creasote employed?

Either alone (dilute or full strength) or in combination with oil of cloves, spt. camph. or tinct. aconite, etc., and as a vehicle for anodyne salts.

Q.—For pericementitis how should it be employed?

In combination with tinct. iodine, tinct. aconite and spts. camphor.

Q.—How is it applied as a styptic?

On lint or cotton with pressure.

Q.—In what other ways is Creasote useful to the Dentist?

In a watery solution it is recommended in the treatment of caries and necrosis of the maxillary bones, as a stimulant application to wounds, ulcerated surfaces, etc.

Give some formulæ containing Creasote.

For Acute Pericementitis.

℞	Tinct. Aconiti Rad.,		fʒj
	Creasoti (pure wood),		
	Tinct. Iodi,		
	Spts. Camph.,	āā	f℥ss

M. et Signa: Apply one or two drops to the gingivæ.

(Stevens.)

For Odontalgia, Pulpitis.

℞	Creasoti (pure wood),	
	Morph. Acetat.,	gr. x

M. Signa: Apply on cotton to exposed pulp.

For Wiping Out Simple Cavities Prior to Filling.

℞	Creasoti (pure wood),		
	Eucalyptol,		
	Ol. Caryophyl,		
	Ol. Cassiæ,	āā	℥ss

M.

(Finely powdered parched coffee is a good deodorizer.)

GUAIACOL.

Q.—What is Guaiacol?

(Mono-methyl-Catechol, metnyl ether of pyro-catechin), technically termed Methylpyrocatechin, is an oily liquid compound constituting from 60 to 90 per cent. of beech-wood-tar Creasote.

Q.—How is it obtained?

By the fractional distillation of the Creasote, the fraction passing over between 200° and 205° C. being collected and purified.

Q.—Is this substance obtained from any other source?

Yes. It is obtained from the dry distillation of guaiacum resin, and from calcium vanillate with slaked lime, etc.

Q.—What are its physical properties?

A colorless, oily, strongly refractive liquid of peculiar odor and neutral reaction. Sp. gr. at 15° C., 1.117; boiling point, 200–202° C.

Q.—In what is it soluble?

Sparingly soluble in water (1-200) but readily in alcohol, ether, fixed oils, etc.

Q.—Give a test for the presence of Guaiacol.

The alcoholic solution gives, on the addition of a trace of ferric chloride, a blue color which turns to emerald green when more ferric chloride is added.

Q.—What are the physiological effects and therapeutic uses of Guaiacol?

The same as Creasote. Guaiacol was introduced as a substitute for Creasote (being its active principle), and when pure is more constant in composition. The odor is more pleasant, and it is more antiseptic.

Q.—What is the dose of Guaiacol?

♏ j, gradually increased till 15 minims are taken per day.

RESORCINUM.—Resorcin.

Q.—What is Resorcin?

One of the three isomeric substances formed by substituting two atoms of hydroxyl for two of hydrogen in benzene, as the substitution of one produces Carbolic Acid.

Q.—When was it first prepared?

In 1864, by Barth and Hlasiwetz.

Q.—How was it prepared?

By fusing umbelliferous resins with potash. It is now prepared synthetically.

Q.—How is it prepared from gum ammonica?

An alcoholic extract of ammoniac is fused with three times its weight of potassa, and dissolving the resulting homogeneous mass in water slightly acidulated with sulphuric acid, following this by agitating with ether. On evaporating the ether, impure resorcin is left, which is purified by recrystallization.

Q.—What is the chemical status of Resorcin?

The Meta-di-hydroxy-benzol; C_6H_4 (OH_2); an oxy-phenol.

Q.—What are its physical properties?

Colorless, or faintly yellowish tubular or columnar crystals with slight urinous odor, unpleasant sweetish, pungent taste. Pure and anhydrous, it melts at 118° C and boils at 276° C.

Q.—In what is it soluble?

Readily in water, alcohol and ether, but scarcely at all in cold benzol, chloroform or carbon bisulphide.

Q.—What is the dose of Resorcin?

Usually from 5 to 15 grains; a drachm may be given at a dose, as an antiseptic.

Q.—What are the physiological actions of Resorcin?

A most efficient antiseptic and antiferment; it is a non-irritant to the skin, and but very slightly to subcutaneous tissue. In strong solution it irritates mucous membranes and may vesicate them. In full doses, antipyretic, but causes nausea, oppression, languor and free perspiration.

Q.—What are its therapeutic uses?

It is a decided antiferment with antiseptic properties; its solubility and lack of odor make it a valuable application for the throat, nose and gastro-intestinal tract to foul ulcers and sloughing wounds; an ointment of ʒj to the ℥ is efficacious in certain diseases of the skin.

Q.—What are its Dental uses?

Resorcin may be employed in dental practice in all cases where an antiseptic is desired, as a dressing to pulp canals, to the gums in pyorrhœa, as an ingredient of lotions, washes, etc.

Give a formula containing Resorcin.

For the abortive treatment of Herpes.

℞	Resorcini,	ʒss
	Cocaini Hydrochlor,	gr. v iij vel xxx
	Acidi tannici,	℥iss
	Alcoholis,	f℥iij

M. Signa: Apply with soft brush.

(NOTE.—Hydroquinone and Pyrocatechin have similar properties to those of Resorcin, but they are several times stronger and correspondingly more active. Being respectively meta, para, and ortho-oxyphenol.)

ACIDUM SALICYLICUM.—Salicylic Acid.

Q.—From what is Salicylic Acid obtained?

Salicylic Acid is a derivative of Salicin, a crystalline glucoside found in *Gaultheria procumbens*, and in the bark of several species of Salix (willow). It is also obtained synthetically by combining the elements of Carbolic Acid with subsequent purification.

Q.—Of the two sources which produces the best?

The Acid prepared from natural sources is purer and more-efficient than that prepared artificially.

Q.—What are its physical properties?

Occurs in fine white needle shaped crystals.

Q.—In what is it soluble?

Sparingly soluble in cold water (1-450), in hot water (1-14). Soluble in alcohol and ether. (It forms salts with bases.)

Q.—What is the dose of Salicylic Acid?

Gr. x–ʒj.

Q.—What salicylates are official?

Those of Sodium, Lithium, and Physostigmine.

Q.—What are the physiological effects of Salicylic Acid?

Tonic, antipyretic, antiferment and antiseptic. In small doses it stimulates the stomach, heart and respiration, but large doses irritate the stomach, and depresses the heart and respiration, lower arterial tension, and reduce temperature in fever. It is destructive to the torula, prevents alcoholic fermentation, as also that caused by the organic ferments (pepsin, ptyalin, etc.) Salicylate of Sodium is remarkably antipyretic and anti-rheumatic.

Q—What are its Therapeutic uses?

Chiefly as an anti-rheumatic, to relieve pain, lowers temperature, and reduces articular swellings. As a local application to corns, warts, etc., and in eczema, gangrenous wounds, fetid perspiration, etc. In the form of Salol, it is valuable in duodenal catarrh, bilious headache, and some forms of neuralgia.

Q.—What is Salol?

A salicylate of Phenol, or 60 parts by weight of Salicylic Acid and 40 of Carbolic Acid. Insoluble in water, almost tasteless and odorless. Dose, gr.v–ʒj.

Q.—What are the Dental uses of Salicylates?

As an antiferment and antiseptic in suppurating and gangrenous tissues, as a dressing for pulp canals pyogenic membranes, as an ingredient of dentifrices. In dental manifestations of rheumatic diatheses the internal exhibition of Salicylate of Sodium or Salol is accompanied by good results, as also some forms of neuralgia. Give formulæ:

For Rheumatic Neuralgia.

℞ Sodii Salicylas, ʒij
Ft. Cap. No. 6.
Signa: One Caspule every four hours.

℞ Salol, ʒss
Ft. Cap. No. 6.
Signa: One Cap. every two hours.

NAPTHALINUM.—Napthalin.

Q.—What is Napthalin?

Known as Coal-tar Camphor; is a derivative of benzin, separated from coal-tar by distillation. $C_{10}H_8$.

Q.—By whom was it discovered?

By Garden, in 1820.

Q.—What are its physical properties?

Occurs in the form of white crystals, which may be compressed into cakes like camphor. It has a peculiar odor, and is inflammable.

Q.—In what is it soluble?

Insoluble in water, but soluble in alcohol, ether, chloroform and oils.

Q.—What is its dose?

Gr. j–x.

Q—What are its physiological effects?

Internally, it is an intestinal antiseptic, an expectorant, and devoid of local irritating properties at the point of elimination.

Q.—What is its therapy?

As an antiseptic to ulcers, cancers, pus cavities, etc., and in some forms of skin disease.

Q.—What is Napthol? C_{10},H_7,HO.

An alcoholic derivative of Napthalin.

Q.—How many Napthols are thus obtained, and how are they designated?

Two; and are known as Alpha- and Beta-napthols.

Q.—How are they obtained?

By heating together for several hours napthaline and sulphuric acid, with subsequent purification.

Q.—Which of these two napthols are given the preference as a medicinal agent?

The Beta-Napthol.

Q.—In what is Beta-Napthol soluble?

In 75 parts of boiling water, freely soluble in alcohol ether, chloroform and fixed oils.

Q.—What claims are advanced as to its antiseptic power?

That it is 12 times as powerful as Carbolic Acid, 30 times as potent as salicylic acid, and 60 times as efficient as boric acid, 600 times as antiseptic as alcohol, and is entitled to stand next to Mercuric Chloride. (Levis.)

Q.—What is Hydronapthol?

Hydronapthol exists only as an impure form of Beta-Napthol. (Its chemistry is in doubt.)

Q.—What are the therapeutic uses of Beta-Napthol?

Being non-poisonous, and without odor its great power as an antiseptic renders it valuable. Its value is also increased by a feeble stimulating and sedative action. As a local application in parasitic skin diseases, as well as those dependent upon defective secretion. As a deodorant in cancer and ozæna, and as a dressing to wounds, ulcers, etc.

Q.—What are the dental uses of Napthol?

The aforementioned physical properties make B. Napthol a valued addition to the Dental cabinet, a powerful, safe and sure antiseptic, slightly stimulating and particularly sedative, it is especially indicated in alveolar abscess, pyorrhœa, stomatitis, ulcerations, ozæna, etc., as an ingredient of lotions.

Q.—What is Camphorated-Napthol?

B-Napthol, 1 part; Camphor, 2; forming a colorless syrupy liquid, and a valuable antiseptic dressing.

Q.—What is Sali-Napthol?

A combination of Napthol and Salicylic Acid recommended in articular rheumatism.

Give formulæ containing B. Napthol.

For Mercurial Stomatitis.

℞	Napthol, beta,	ʒss
	Glycerini,	f℥iv
	Aq. Hamamel, dest.,	f℥ij
M.	Signa: Use as a gargle.	(Shoemaker.)

Dressing to canal in pericementitis.

℞	Napthol, beta,		ʒss
	Glycerini,		
	Aq. Hamamel, dest.,	āā	f℥ss
M	Signa: Apply on cotton.		

For diarrhea, flatulent dyspepsia, and dilatation of stomach.

℞	Napthol, beta,		
	Bismuth Salicylas,		
	Magnes. Calcinat.,	āā	gr. cl.

M. et, div. in chart No. xxx.

Signa: One powder before each of the two principal meals.

(Dujardin Beaumets.)

Canal Dressing.

℞	Glycerini,	f℥ss
	Napthol, beta	q. s. to make a paste.

ACIDUM BORICUM.—Boric Acid.

Q.—What are the synomyms for Boric Acid?

Boracic Acid, Orthoboric Acid, and the "Sedative Salts of Homberg."

Q.—What is Boric Acid chemically?

Hydrogen orthoborate,–H_3,BO_3.

Q.—How is it prepared?

By slowly decomposing a boiling, concentrated solution of borax with an excess of H_2,SO_4, and allowing the acid to crystallize. (Witthaus.) Boric acid is made from borax by adding HCl to a hot solution of the former, which causes a precipitate of boric acid. (Mitchell.)

Q.—What are its physical properties?

Brilliant, white, odorless, six-sided plates, greasy to the touch, slightly soluble, in cold water, 1–25; hot water, 1–3; alcohol, 1–6, and soluble in glycerin.

Q.—What is Boroglyceride?

A combination of Boric acid and glycerin.

Q.—What is the physiological action of Boric Acid?

A non-irritant antiseptic. It destroys microorganisms and arrests fermentation and putrefactive decomposition. Combined with H_2O_2 it is decidedly effective as a detergent.

Q.—For what purpose is it used?

As a dressing for wounds and suppurating surfaces and cavities, in chronic, scaly and parasitic skin affections and in bromidrosis of the feet.

Q.—What are its Dental uses?

Aa a non-irritating, non-poisonous ingredient of lotions, injections and dentifrices it is of service to the dentist, and can be used with impunity in all cases requiring an antiseptic detergent.

Give formulæ.

For a detergent lotion or injection:

℞ Hydrogen Dioxide, f℥j
Acidi Borici, q. s. ad. sat.
Signa: Use ad. lib.

For Fetid perspiration and oily skin:

℞	Acidi Borici,	ʒj
	Aq. hamamel dest,,	f℥iv

For Apthous ulcerations, abarsions by artificial dentures. fissured tongue, etc.

℞	Acidi Borici,	gr. Lxv
	Olei Gaultheriæ,	f℥ss
	Glycerini,	f℥iv
	Alcoholis;	fʒj
	Aquæ, q. s. ad.	f℥iv

Signa: Use as a gargle or wash.

(PIERCE.)

A Solvent for Sordes.

℞	Acidi Borici,	gr. xxx
	Potassii Chloratis,	gr. xx
	Limonis succi,	fʒv
	Glycerini,	fʒiij, ♏

Signa: Rub the teeth and gums with the above once or twice a day.

IODOFORMUM.—Iodoform.

Q.—What is Iodoform, chemically?

The Iodide of formyl, or formyl teriodide, $(C H I_3)$. Similar in theoretical constitution to chloroform, except that it contains iodine instead of chlorine.

Q.—How is it obtained?

By acting on alcohol, aldehyde, and many other substances with Iodine and potassiom carbonate or hydrate.

Q.—How is it usually prepared?

By the action of chlorinated lime upon a heated alcoholic solution of potassium iodide, which yields calcium iodate and Iodoform, the latter being separated by the solvent action of boiling alcohol.

Q.—What are its physical properties?

It occurs in the form of small scaly, yellow crystals, with a saffron-like odor, and sweet taste.

Q.—In what is it soluble?

Insoluble in water, acids and alkaline solutions; soluble in alcohol, ether, chloroform carbon disulphide, the fixed and volatile oils.

Q.—What percentage of iodine is contained in Iodoform?

It should contain 96.7 per cent. of its weight of iodine.

Q.—What are its preparations?

Iodoformum,	dose gr. ij–v
Unguentum Iodoformi (10 per cent).	

Q.—What is Bituminated Iodoform?

A combination of Iodoform and tar (prepared by Dr. Ehrmanm, of Vienna), in which the particles of each are so closely mixed that only hyaline plates can be discovered under the microscope; the characteristic crystals of Iodoform cannot be distinguished at all.

Q—What are its advantages?

The preparation can be easily pulverized and has a more pleasant odor. (Ther. Gaz. Vol. iv, p. 850).

Q.—By whom was it discovered?

By Serullas, in 1822, and introduced into medicine in 1837 by Bouchardat, also by Dr. Glover, of London.

Q.—What are its physiological effects?

Internally it is a tonic and alterative. Moderate doses stimulate the cardiac-inhibitory centre, slowing and strengthening the cardiac beat and elevating the blood pressure, while large doses depress the centre and finally paralyze the cardiac muscle.

Q.—What is the effect of excessive amounts being absorbed?

Glomerulo-nephritis and fatty degeneration of various organs occur. Externally it is antiseptic, a local anæsthetic and stimulant.

Q.—How may the symptoms of poisoning by this substance be divided?

Into six classes, the danger increasing progressively from the first to the last:—

1. High fever. 2. Fever, gastro-enteric irritation, rapid pulse. 3. Very rapid, compressible pulse, no fever. 4. Very rapid pulse and high fever. 5. Great depression and collapse, rapidly fatal. 6. Symptoms like meningitis.

Q.—Should poisoning occur, how should it be treated?

Remove all Iodoform, give opium and stimulants, and treat symptoms.

Q.—What are the therapeutic uses of Iodoform?

Internally as a cardiac tonic in valvular disease, as an alterative in syphilitic rheumatism, neuralgia and the early stages of phthisis and in diabetes. In the different forms of catarrh of the stomach and bowels it has rendered service. Externally it is a universal antiseptic dressing for wounds, injuries and diseases, such as chancres, ulcers, sloughing, phagedenic ulcers, surgical operations, etc. An etherial solution is injected in the cavities of abscesses, after the evacuation of their contents. In suppositories it is used in inflammation of the vagina, uterus and rectum.

Q.—What are its Dental uses?

While the unpleasant and penetrating odor of Iodoform is objectionable and faith in its antiseptic powers has been greatly disturbed, it is still, by some, considered a valuable agent in the dental cabinet. As a dressing in oral surgery, and as an application to pulp canals, and the gums in pyorrhœa, it is still used, and as a component of mixtures for pulp capping and nerve pastes it finds a place.

Q.—How can the odor of Iodoform de disguised?

By combination with finely powdered, recently parched coffee, thymol, menthol, oil of cinnamon, oil of sassafras, creolin, napthalin, etc.

Q.—As an application in pyorrhœa, how is it usually applied?

Either alone or in combination.

Q.—As a dressing for pulp canals, how is it usually combined?

It may be used in etherial solution, or in combination with eucalyptol, thymol, menthol, terpinol, eugenol, etc.

Q.—For pulp capping how is it employed?

In powder, incorporated with kaolin, oxide of zinc, etc., using carbolic acid, creasote, or oils for a vehicle.

Give formulæ containing Iodoform.

For deodorized Iodoform.

℞	Iodoformi,	gr. xv
	Mentholis,	gr. $\frac{3}{4}$
	Spts. Lavdeulæ,	gtt, iij
M.		(CAUBRELLE.)

Pulvis Iodoformi Dilutus. (Without odor.)

℞	Iodoformi,	2 parts.
	Acidi Borici,	3 parts.
	Napthalini,	5 parts.
	Ol. Bergamii, q. s.	
M.		(SHOEMAKER.)

Etherial solution of Iodoform.

℞	Ætheris,	℥j
	Iodoformi, q. s. ad. sat.	

For a nerve paste.

℞	Iodoformi.		
	Acidi Arseniosi.	āā	gr. x
	Creasoti, (pure wood)		q. s.
M			

IODOL.

Q.—What is Iodol?

Chemically it is tetra-iodo-pyrol C_4I_4NH.

Q.—How is it obtained?

By action of Iodine on pyrol, a constituent of mineral oil.

Q.—What per centage of Iodine does it contain?

About 90 per cent.

Q.—What are its physical properties?

Iodol occurs as a grayish white powder, which darkens upon exposure to light.

Q.—In what is it soluble?

Insoluble, or nearly so in water; freely soluble in ether, chloroform, alcohol, and fatty oils. It is soluble in the gastric secretions, and, like iodoform, is decomposed in the organism.

Q.—What are its uses?

As a substitute for iodoform.

Q.—What are its advantages?

It is non-toxic and free from odor.

ARISTOL.

Q.—What is Aristol?

A combination of Iodine and thymol, dithymol-diiodide.

Q.—How is it obtained?

By adding a solution of iodine in iodide of potassium to an aqueous solution of hydrate of sodium containing thymol.

Q.—What per centage of iodine does it contain?

About 46 per cent.

Q.—What are its physical properties?

A brownish-red, odorless, amorphous powder, easily decomposed by light and heat.

Q.—In what is it soluble?

Insoluble in water and glycerin, slightly soluble in alcohol, and readily in ether; also taken up by the fatty oils when rubbed together with them.

Q.—What are its uses?

As a substitute (externally) for Iodoform.

Q.—What are its advantages?

It is non-toxic and odorless, and seems to be more powerful in promoting healthy cicatrization.

SOZOIODOL.

(Diiodparaphenolsulphonic Acid.) $C_6H_2I_2OHSO_3H$.

Q.—What is Sozoiodol?

A crystalline monobasic acid, introduced in 1887 as an antiseptic.

Q.—What does it contain?

It contains 32.8 per cent. of iodine, 20 per cent. of phenol, and 7 per cent. of sulphur.

Q.—What Sozoiodol salts are mostly used?

Those of potassium, sodium, mercury and xinc.

Q.—What are the medicinal uses of Sozoiodol?

As an antiseptic, to be used in all cases where iodoform is considered indicated.

Q.—What advantages does it possess?

Odorless, stable under all normal conditions, and non-toxic. (Bacteriological experiments prove that 2 per cent. of Sozoiodol prevents the development of the microbes of pus.) (HELBING.)

Q.—What are the physical properties of Sozoiodol potassium?

It occurs in colorless, well-formed prisms, soluble in about 50 parts of water to an acid liquid, which gives a violet blue with ferric chloride. Being less soluble than the sodium compound, it is credited with more lasting action. It diminishes secretion and is drying. (HELBING.)

LISTERINE.

Q.—What is Listerine?

A proprietary compound made by the Lambert Pharmacal Co., of St. Louis.

Q.—Of what is it composed?

The proprietors give the following formula: "Listerine is the essential antiseptic constituent of Thyme, Eucalyptus, Baptisia, Gaultheria and Mentha Arvensis in combination. Each fluid drachm containing two grains of refined and purified Benzo-boracic acid."

Q.—What is the dose of Listerine?

One teaspoonful three or more times a day, either full strength, or diluted with water, or in combination with other drugs.

Q.—What are the physiological actions of Listerine?

Anti-ferment, and non-toxic, non-irritant, and non-escharotic, antiseptic and deodorant.

Q.—What are its therapeutic uses?

To correct the disorders of digeston, and to counteract intestinal putrefactive processes. It is efficient in the treatment of diseases produced by the fermentation of food, the decomposition of organic matter, the endo-development of fetid gases, and the presence or attack of low forms of microbic life. Externally as a local application to ulcers, wounds and abscesses, or as a gargle, mouth wash, inhalant, or injection to be used ad libitum.

Q.—What are the Dental uses of Listerine?

As an antiseptic and prophylactic, Listerine is especially adapted to dental and oral surgery. In cavities of the teeth, ulcerations, of mucous membranes and wounds of the mouth' necrosis and caries of the maxillary bones, and as a mouth wash for daily use, or after the extraction of teeth, and to correct fetid breath, it is a valuable addition to the dental cabinet. As a vehicle for the exhibition of other medicaments it is useful.

Q.—As a daily mouth wash, what proportions of this agent seem to be sufficient?

About a teaspoonful to a glass of water, increased *pro re nata*.

Give formulæ containg Listerine.

For stomatitis of Dentition.

℞	Listerini,	ʒj
	Syr. Simp.,	ʒvij

M.

℞	Listerini,	℥j
	Glycerini,	℥ss
	Water,	℥ij

M. Signa: Both the above to be used as a spray, and in teaspoonful doses after feeding.

As a Germicide:

℞	Hydrarg. Bichlor,	gr. j
	Listerini,	f℥ivss

(about 1-2,000)

For sore throat.

℞	Listerini,	℥ij
	Acidi Tannici,	gr. xx
	Glycerini,	℥j
	Aquæ,	℥iij

M. Signa: Use as a gargle three or four times a day.

EUCALYPTUS.

Q.—What is Eucalyptol?

A derivative from the leaves of Eucalyptus globulus, or blue gum-tree. (Nat. Ord. Myrtaceæ), a native of Australia, but now grown in the United States, Italy, etc.

Q.—What do these leaves contain?

A volatile oil, a crystallizable resin and some tannin.

Q.—What does the volatile oil contain?

By fractional distillation it is separated into three oils of different density, the highest and most important being Eucalyptol, an oxygenated oil; the others being Terpene and Cymol.

Q.—What is the chemical formula of Eucalyptol?

$C_{10}H_{18}O$.

Q.—What are its physical properties?

A colorless liquid of aromatic odor, slightly soluble in water, but insoluble in alcohol. It has a solvent action on gutta percha.

Q.—How can the purity of this substance be established?

The pure should be perfectly clear, of sp. gr. 0.910 to 0.920 at 60° F. and boil between 338° and 343° F. Ninety per cent. alcohol makes a clear solution, while the Eucalyptus oil is but slightly soluble in it.

Q.—What are the physiological actions of Eucalyptol?

One of the most powerful of the antiseptic oils; carminative, digestive, tonic, laxative, diaphoretic, expectorant and diuretic. The oil of Eucalyptus is not so efficient an antiseptic as Eucalyptol, and is not nearly so clean a preparation.

Q.—What are its therapeutic uses?

The antiseptic oils are demanding the attention of the profession more and more every day. They certainly deserve a place in surgical therapeusis, and no doubt will continue to knock until their rights are recognized. Dissolved in alcohol and administered internally they prevent fermentation and correct flatulencey. Useful in bronchorrhœa, choleraic vomiting, parasitic skin disease, worms, rheumatism, septicæmia, pyæmia, uterine catarrh, etc.

Q.—What are their Dental uses?

As antiseptics, disinfectants and diffusible stimulants, they are taking the first rank in dental practice. Used in the treatment of alveolar abscesses, pyorrhœa, ulceration and stomatitis, and as components of mouth washes and dental anodynes.

Q.—What effect has Eucalyptol on gutta percha?

It has a solvent action, and this fact should be kept in mind when using it in root canals.

Give formulæ containing Eucalyptol.

For Abscess of Antrum.

℞	Eucalyptol,	ʒij
	Acidi Carbolici,	gtt x
	Glycerini,	ʒij
	Ol. Gaultheriæ,	ʒss
M.	Signa: To be used as an injection.	

For putrid root canals.

℞	Eucalyptol,	ʒj
	Iodoformi,	gr. xv
M.	Signa: Use as a dressing.	

For an antiseptic dressng.

℞	Eucalyptol,		
	Ol. Caryophyl		
	Ol. Cassiæ,		
M.	Creasoti (p. w.),	āā	ʒj

OLEUM CARYOPHYLLI—Oil of Cloves.

Q.—What are Cloves?

The dried, unexpanded flowers of *Eugenia Caryophyllata* (Nat. Ord. Myrtaceæ), a large tree of the Spice Islands and Africa.

Q.—What do the leaves contain?

A heavy volatile oil (15 to 20 per cent.). *Eugenin*, a tasteless crystalline substance, salicylic acid, and *Caryophyllin*.

Q.—What does the Oil of Cloves contain?

Besides the above it contains tannin, resin and an oxygenized oil called *Eugenol*, or *Eugenic acid*.

Q.—What is the chemical formula for Eugenol?

$C_{10}H_{12}O_2$.

Q.—How is it prepared?

The crude Oil of Cloves, treated with potassa, is distilled, and the residue is subjected to the action of a mineral acid, obtained from cinnamon leaves.

Q.—What are the physical properties of Eugenol?

Colorless oil, sp. gr. 1.07, spicy burning taste, soluble in water and alcohol. Reddens litmus, and coagulates albumen on contact with air, becomes darker and resinous. (It is properly an acid.)

Q.—What are the Dental uses of Oil of Cloves and Eugenol?

Mostly as an anodyne in odontalgia, and as a deodorant. Eugenol is sometimes used as an antiseptic in root-canals, pus-pockets, etc., and is said to be very effective.

Q.—What is the dose of Oil of Cloves?

♏j–vi.

TERPINOL.

Q.—From what is Terpinol obtained?

From the Oil of Turpentine,

Q.—What are Terpenes?

Terpene is the general name for hydro-carbons having $C_{10}H_{16}$ or some multiple for their composition.

Q.—How does Terpene differ from Terpin or Terpine?

Terpin is a particular member of the group to which the general name Terpene is given.

Q.—How is Terpinol produced from oil of turpentine?

By the oxidation of the oil of turpentine by means of sulphuric acid, *Terebene*, $C_{10}H_{16}$, is obtained. By distilling the oil of turpentine with an alkali, *Terebinthene*, $C_{10}H_{16}$, another isomeric compound is obtained. This by hydration, is converted into *Terpine*, a solid, crystalline body, soluble in glycerin. Then acting on Terpine with an acid we obtain *Terpinol*, an oily body.

Q.—What are the physical properties of Terpinol?

A colorless liquid, with an odor like the hyacinth. None of these derivatives are soluble in water, but all are in alcohol.

Q.—What is "Sanitas?"

A solution obtained by the action of water upon oxidized turpentine, claiming disinfectant properties, its active principle being H_2O_2.

Q.—What are the physiological actions of these derivatives?

The turpentines are all diuretic, stimulant, antispasmodic, rubifacient, hæmostatic, anthelmintic and antiseptic.

Q.—What are their therapeutic uses?

Externally as rubefacients and antiseptics; internally as hæmostatics, antispasmodics, anthelmintics, antiseptics, stimulating expectorants, diuretics, and emmenagogues.

Q.—What are their Dental uses?

As dental medicaments, the preference seems to be given to Terpinol and Oil of Sanitas. Used as antiseptics, disinfectants and deodorizers in all cases where such agents are indicated; and as a prophylactic agent in phosphorus poisoning, and phosphor-necrosis of the maxilla. Oil of turpentine is also employed as a sterilizer of instruments, gauze, bandages, towels, etc.

THYMOL AND MENTHOL.

Q.—What is Thymol?

Thymol, or thymic acid is a derivative of *Thymus Vulgaris* (Nat. Ord. Labiateæ), or common thyme, cultivated in gardens as an herb.

Q.—What is the active constituent of the plant?

A volatile oil.

Q.—Of what does the oil consist?

Of two portions, the lighter and more volatile, being the hydrocarbons *cymene* and *thymene*, the second chiefly *Thymol*. $C_{10}H_{14}O$.

Q.—Is Thymol obtained from any other source?

Yes, it has been obtained from several plants.

Q.—What are the official preparations of Thymol?

Oleum Thymi,	dose ♏j-ij
Thymol,	gr. ss-ij

Q.—What are the physical properties of Thymol?

It occurs in large prismatic crystals. with a pungent, aromatic odor. They sink in cold water, melt and rise to the surface when the mixture is heated to 110°-125° F., and volatilize completely at the temperature of a water bath.

Q.—In what is Thymol soluble?

Soluble in alcohol, ether, solutions of alkalies. chloroform, benzin, glacial acetic acid, and oils. 1200 parts of cold and 900 of boiling water:

Q.—What is Menthol?

The stearoptin, or camphor of the oil of pepperment.

Q.—From what plant is Menthol obtained?

From the fresh herb *mentha arvenis* and *mentha piperita* (Nat. Ord. Labiateæ.) Cultivated in gardens.

Q.—What portions of these plants are used?

The leaves and tops.

Q.—How is Menthol obtained from the oil?

Either by long keeping or being cooled at a low temperature?

Q.—What is Menthol chemically?

$C_{10}H_{20}O$. It is an alcohol.

Q.—What are are its physical properties?

It occurs in small, colorless crystals or masses, havthe taste and smell of peppermint.

Q.—In what is it soluble?

In alcohol, ether, fixed and volatile oils, but very sparingly in water.

Q.—What are the physiological actions of Menthol and Thymol?

The mints are aromatic stimulants, carminatives and antispasmodics, theii oils possessing these qualities in greater degree being also local anodynes and anæsthetics and antiseptics. Thymol resembles both carbolic acid and oil of turpentine in its action, being a powerful antiseptic and germicide, and an irritant to the organs of elimination and paralyzant.

Q.—What are the therapeutic uses of these agents?

Menthol is used locally as an antiseptic and analgesic, and Thymol as an antiseptic to wounds and skin diseases, and as a spray or inhalation in chronic affections of the lungs and bronchi.

Q.—What are the Dental uses of these agents?

Menthol as an external remedy in facial neuralgia, odontalgia obtundent of sensitive dentine, and as a local anæsthetic. Thymol as an antiseptic dressing to pulp canals, suppurating pulps and ulcers of the mouth, wounds, etc. Both of these agents may be used as an ingredient of nerve paste and mouth washes.

Give formulæ:

For Neuralgia and Odontalgia.

℞ Mentholis,		gr. v
Olei Caryophyl. (vel. Cajeput),		fʒj

M. Signa: To be painted on affected part, or for odontalgia, applied on cotton. (GORGAS.)

As a local application in Dermatalgia, Herpes zoster and Neuralgia.

℞ Tinct. Belladonnæ,		
Tinct. Aconiti,	āā	fʒiss
Mentholis,		ʒss
Spts. Vini Rect.,		f℥ij
Glycerini,		
Aquæ rosæ,	āā	f℥ss

M. Signa: Use as a local application. (SHOEMAKER.)

Local Anaesthetic.

℞ Chloroformi,		ʒv
Æther. Sulph.,		℥j
Mentholis,		ʒss

M. Signa: Use with spray apparatus. (GORGAS.)

As an internal anodyne in Migraine, Neuralgia, etc.

℞ Mentholis,		
Acetanilidi,	āā	ʒj
Sacchar. lact. q. s.		
Ft. Cap. No. xxiv.		

M. Signa: Two capsules every three hours.

For suppurating Pulps, Abscesses, etc.

℞ Thymolis,		
Iodi,		
Potassi iodidi,	āā	ptm j
Glycerini,		pts. v to xv

M. Signa: Use as a dressing.

Antiseptic mouth wash.

℞ Thymol,	grs. iv
Benzoic Acid,	grs. xlv
Eucalyptol,	ʒiijss
Alcohol,	ʒxxv
Oil of Wintergreen,	gtt. xxv

M. Signa: Teaspoonful in a glass of water as a mouth wash after meals and before retiring. (MILLER.)

MYRTOL

Q.—From what is Myrtol derived?

From the leaves and berries of the *Myrtus communis* (Nat. Ord. Myrtaceæ), a Mediterranean plant.

Q.—What is Myrtol?

A volatile oil containing various terpenes, cineol, and a camphor-like substance.

Q.—What are its physical properties?

A liquid possessing the characteristic perfume of the plant, of less density than water, and evaporates at the ordinary temperature.

Q.—What are the physiological actions of Myrtol?

Disinfectant, antiseptic and non-irritant to the skin.

Q.—What are its therapeutics?

As a disinfectant for wounds and ulcers, and as an application in cutaneous diseases of vegetable parasitic origin. Internally as an anthelmintic, expectorant and hæmostatic.

Q.—What are its Dental uses?

Same as the other antiseptic oils.

NOTE. (For Permanganate of Potassium see article on Manganese.)

OIL OF CINNAMON—Oil of Cassia.

Q.—What is Cinnamon?

The inner bark of the shoots of *Cinnamon Zeylanicum* (Ceylon cinnamon), or one or more species of cinnamon grown in China (Chinese Cinnamon or Cassia), large trees (Nat. Ord. Lauraceæ.)

Q.—What do these barks contain?

Besides a volatile oil, tannic acid, mucilage, coloring matter, an acid and lignin.

Q.—From which variety is the oil of Cinnamon derived?

From the Ceylon Cinnamon.

Q.—From which variety is the oil of Cassia derived?

From the Chinese Cinnamon.

Q.—How do these oils differ?

The oil of Cinnamon has the finer flavor, is more expensive, slightly acid reaction, and sp. gr. about 1.040. The oil of Cassia is cheaper, its odor and taste not quite so agreeable, sp. gr. about 1.060, slightly acid, and, according to Black, possessing greater antiseptic power.

Q.—In what are these oils soluble?

Readily soluble in alcohol.

Q.—What are the preparations of Cinnamon?

Oleum Cinnamomi,	dose ♏j–iij
Tinctura Cinnamomi,	dose fʒj–iv
Aqua Cinnamomi,	dose f℥ss–iv
Spiritus Cinnamomi,	dose fʒi–ij
Pulvis Aromaticus (Cinnamon and ginger, āā 35 parts, Cardamon and Nutmeg, āā 15 parts)	gr. v–xxx

Q.—What are the physiological actions of Cinnamon?

An aromatic, with considerable astringency; and a hæmostatic and stimulant.

Q.—What are its therapeutic uses?

Mostly as a flavoring and adjunct to other medicines; as a stomachic in flatulent and feeble digestion, and in combination with chalk mixture in diarrhea.

Q.—What are its Dental nses?

The powder and oil are used as ingredients of dentifrices, being stimulant, astringent and aromatic. The oil for odontalgia, pulp and canal dressings, and as an application in pyorrhœa.

Q.—What is Black's 1-2-3 Mixture?

Carbolic Acid. (Melted crystals),	ptm. 1
Oil of Cassia	pts. 2
Oil of Wintergreen,	pts. 3

Mix the oils and add the melted crystals.

Q.—What is Newkirk's Dressing?

℞	Eugenol.		
	Oil of Cassia,	āā	pts. 3
	Carbolic Acid (Crys.),		pts. 2

GAULTHERIA.—Partridge-Berry, Wintergreen, Tea-Berry.

Q.—What is Gaultheria?

A small plant growing in the woods of North America; *Gaultheria procumbeus* (Nat. Ord. Ericaceæ)

Q.—What part of the plant is official?

The leaves.

Q.—What do they contain?

A volatile oil, *arbutin*, *urson*, *ericolin*, tannic acid, etc.

Q.—Of what does this Volatile Oil consist?

Of *gaultherilene* (10 per cent.), and methyl salicylate (90 per cent.), which yields a pure salicylic acid.

Q.—What are the physical properties of the oil of Gaultheria?

Aromatic, slightly bitter and astringent. The heaviest of the volatile oils.

Q.—What are the preparations of Gaultheria?

Oleum Gaultheriæ,	dose ♏ij–xx
Spiritus Gaultheriæ,	(3 per cent., for flavoring.)

Q.—What are the physiological actions of Gaultheria?

The oil of gaultheria is antiseptic, astringent and antipyretic.

Q.—What is its therapy?

It has been used as a substitute for salicylic acid in articular rheumatism, as an astringent in enteric diseases, and as an emmenagogue and galactagogue; also as a flavoring.

Q.—What are its Dental uses?

As an aromatic, astringent, tonic and antiseptic flavoring for dentrifrices and lotions.

OIL OF CAJUPUT.

Q.—What is the Oil of Cajuput?

The volatile oil distilled from the leaves of *Melaleuca* Cajuputi (Nat. ord. Myrtaceæ) and a native of the Molucca Islands.

Q.—What does the oil contain?

Cajuputol, or bihydrate of *cajuputene* ⅔, and another oil ⅓.

Q.—What are its physical properties?

A bluish green or colorless liquid of camphoraceous odor and neutral reaction, freely soluble in Alcohol.

Q.—What is the dose of Oil of Cajuput?

From ♏ j to v.

Q.—What are its physiological actions?

Cajuput oil is a diffusible stimulant, antispasmodic, diaphoretic and antiseptic.

Q.—What is its therapy?

Not much used internally, used externally as a stimulating rubefacient and counter-irritant, and in emulsion as an injection for ascarides or seat-worms.

Q.—What are its Dental uses?

As an anodyne in odontalgia and neuralgia, as an antiseptic dressing, and as a solvent for gutta-percha.

SACCHARINUM=Saccharin.

Q.—What is Saccharin?

A derivative of coal-tar, discovered by Prof. Remsen, of Johns Hopkins University, and first described by Fahlberg.

Q.—What is Saccharin chemically?

(Anhydro-ortho-sulphamin-benzoic acid) $C_6,H_4,$

$C_6,H_4,\left\{\begin{matrix}CO,\\SO_2,\end{matrix}\right\}NH.$

Q.—What are its physical properties.

A white crystaline powder, with an intensely sweet taste, a faint amygdaloid odor and feebly acid reaction. It is 300 times sweeter than cane sugar.

Q.—In what is it soluble?

Slightly soluble in cold water (1-500). More soluble in alcohol (1-30) or glycerin, or ether, freely so in dilute ammonia, or in solution of sodium bicarbonate (evolving CO_2). It forms soluble salts with the hydrates or carbonates of the alkaline metals.

Q.—What are its physiological actions?

Saccharin is not toxic or deleterious to the human organism, even in doses of 75 grs., is not decomposed in the body, and has little or no effect on digestion. It has considerable antiseptic virtue.

Q.—What is its therapy?

It has been experimented with to some extent as an antiseptic and results seem favorable. Internally it is principally used as a substitute for cane sugar in the diet of obese and diabetic patients. (SHOEMAKER.)

Q.—What are its Dental uses?

As an ingredient for mouth washes it has been found efficacious. A teaspoonful solution of 5 parts of Saccharin in combination with 5 parts sodium bicarbonate and 3-10 parts of salicylic acid in 24 parts of spirits, to a glass of water is recommended as an agreeable antiseptic mouth wash. After considerable experiments, Prof. W. D. Miller speaks highly of Saccharin as an ingredient of the daily mouth wash. His formula is:

℞	Saccharini,	2. 5
	Acidi Benzoici,	3.
	Tinct. Ratanhæ,	15.
	Alcoholis (Abs.)	100.
	Ol. Menth. pip.	.50
	Ol. Cinnam..	.50

M. Signa: Three parts of above to twenty-seven parts of water kept in the mouth a full minute. If instead of water a 4 per cent. solution of H_2, O_2 is used a greater power is manifested.

ACID BENZOICUM—Benzoic Acid.

Q.—What is Benzoin?

A balsamic resin obtained from *Styrax Benzoin* (Nat. Ord. Styraceæ), a tree of the East Indies.

Q.—What does Benzoin contain?

Benzoic Acid, 14 per cent., together with resins, 80 per cent., and a trace of a volatile oil.

Q.—How is the Benzoic Acid obtained?

Either by washing the resin with lime-water or by distillation.

Q.—What are the physical properties of Benzoic Acid?

It occurs in light, feathery plates and needles, having a fragrant odor and a peculiar acrid taste.

Q.—In what is it soluble?

In 500 parts of water, 15 of boiling water, 3 of alcohol, and 1 of boiling alcohol. It is volatilized by heat.

Q.—Are there any other sources of Benzoic Acid?

Yes. It is obtained from toluol and from hippuric acid, the hippuric acid being obtained from the urine of horses and cattle.

Q.—What are the preparations of Benzoin?

Adeps Benzoinatus, *Benzoinated Lard*, (2 per cent.)	
Acidum Benzoicum,	dose gr. x–xxx
Tinctura Benzoini (20 per cent.)	dose fʒss
Tinctura Benzoini Compositus, (Benzoin 12, Aloes 2, Styrax 8, Balsam of Tolu 4, Alcohol 100 parts)	dose fʒss-ij, but generally used locally.

The Benzoates of Ammonium, of Lithium, and of Sodium are official.

Q.—What are the physiological actions of Benzoic Acid?

Stimulant and irritant to mucous membranes and raw surfaces, highly antiseptic and disinfectant, a stimulating expectorant, and diuretic.

Q.—What are its therapeutic uses?

As a stimulating expectorant in chronic bronchial catarrh; as an acidifier of the urine in certain diseases; as an antizymotic in diphtheria, erysipelas and rheumatism, and as an antiseptic addition to fats and ointments for chapped lips, sore nipples, etc.

Q.—What are its Dental uses?

As an antiseptic ingredient of dressings, lotions and dentifrices, and as a local hæmostatic, in combination with powdered alum.

Q.—Give a formula?

Mouth Wash.

℞	Acidi Benzoici,	3.
	Tinct. Eucalypti,	15.

Alcoholis,	100.
Ol. Menth. pip.,	.75

M. Signa: A small quantity in water as a daily mouth wash.
[MILLER.]

SODIUM-SILICO-FLUORIDE.

Q.—By what other names has this agent been known?

As Fluosilicate of Sodium, and "Salufer."

Q.—How is the salt prepared?

By generating hydro-fluo-silicic acid, passing it into water, and then saturating the liquid with carbonate of sodium. (BERENS).

Q.—What are its physical properties?

It occurs as a white crystalline powder almost insoluble in water (about $\frac{3}{5}$ of 1 per cent.) It is non-volatile, and is not destroyed by oxidation. (The literature upon this substance is very meagre and very contradictory. Its chemistry seems to be obscure and its physiological action uncertain.)

Q.—For what therapeutic use has it been noticed?

As a non-escharotic disinfectant it has attracted attention. Berens claiming it to be more powerful than bichloride of mercury in solution of 1-1000 and having the advantage of being non-toxic. As a deduction from his experiments he summarizes the agent as a prompt germicide, an efficient anti-ferment, an excellent deodorant, and coagulates albumen.

Q.—For what purposes has it been employed in Dental practice?

It has been used with good results in putrescent canals, in chronic alveolar abscesses, pyorrhoea alveolaris, etc. As a deodorizer, as a disinfectant, as a non-escharotic coagulant and as a stimulant sufficiently powerful to encourage the formation of new tissues, without acting as an irritant to surrounding tissue.

(VAUGHN)

Q.—What solutions are recommended for Dental application?

One or two grains to the ounce of pure water.

CHLORUM—Chlorine.—Sym. Cl.

Q.—What is Chlorine?

A gaseous element.

What are its physical properties?

More than twice the density of air, of a greenish color, strong and suffocating odor, irrespirable, and even in a state of dilution, very irritating to the air passages.

Q.—For disinfecting purposes, how is it obtained?

By adding HCl to binoxide of manganese

Q.—In what is it soluble?

In water; 1 part, by volume of water dissolves nearly 3 volumes of Chlorine gas.

Q.—How does it occur in nature?

Always in combination, usual source Chloride of Sodium (common salt).

Q.—What are its preparations?

Aqua Chlori (0.4 per cent.)	dose fʒj-v (largely diluted.)
Calx. Chlorata, (25 per cent.)	gr. iij-vj
Liquor Sodæ Chloratæ, (Labarraque's solution.) (2 per cent.)	dose mx-fʒj (largely diluted.)

Q.—What are its physiological actions?

Chlorine is considered the most powerful of all the disinfectants and deodorants. and is an antiseptic and anti-fermentive of great activity. Internally it is converted into HCl and chlorides. Locally, it is an active irritant to the skin and mucous membranes. Inhaled in any quantity, it is irritating to the air passages. It destroys coloring matter of organic origin. (The action of Chlorides has been described under the head of their respective bases.)

Q.—What are the antidotes to Chlorine?

Ammoniacal vapors inhaled to form ammonium chloride. Albumen, if Chlorine preparations have been taken into the stomach. Also a little aqua ammonia, sufficiently diluted may be given with advantage.

Q.—What are the therapeutic uses of Chlorine?

The Chlorinated preparations are used as disinfectants and deodorizers of rooms, drains and discharges from the body. They are rarely used about the person or clothing, as they are too irritating to be inhaled with impunity, and they destroy the color of fabrics. In very dilute solution they are employed as local applications; also as an antidote to hydrocyanic acid.

Q.—What are its Dental uses?

As a disinfectant, and deodorant, in gangrene of the mouth and fauces, apthæ, cancrum oris, and fetor of the breath, and as a bleaching agent in discolored teeth.

Give formulæ:

For Apthæ and Gangrene of the Mouth.

℞	Aquæ Chlori,		℥ss
	Aquæ dest.,		℥iijss
	Syrupi Simp.,		℥ss
M	Signa: To be used as a gargle or lotion.		

[Gorgas.]

For fetor of breath:

℞	Calcis Chlorat,		ʒiij
	Aquæ dest.,		
	Alcoholis,	āā	f℥ij
	Olei Rosae,		gtt. iv
M.	Signa: Teaspoonful in a glass of water as a mouth wash.		

[Bartholow.]

HEAT.

Q.—What is Heat?

Molecular motion.

Q.—How is Heat measured?

By the thermometer.

Q.—What three scales for mkaing thermometeric degrees are now in use?

1. Centigrade; 2, Fahrenheit; and 3, Reaumur.

Q.—How do these scales differ?

In the Centigrade scale, the freezing point of water is zero, the boiling point 100°; in the Farenheit, freezing point 32°; boiling point 212°; in the Reamur, freezing point, zero, and the boiling point 80°

Q.—What ratio do the three scales bear to each other?

Ratio, 5, 9, 4.

Q.—How would you convert the scale of one into the other?

Ratio: 5: 9: 4. If above the freezing point of water, to convert F. into C., subtract 32, divide by 9, and multiply by 5. F. into R., subtract 32÷9×4. C. into F., divide by 5×9+32. R. into F., divide by 4×9+32.

If below the freezing point, but above 0°F. F. into C.−(32−observed degree)÷9×5. F. into R.−(32−o. d.)÷9×4. C. into F., 32−(o. d.÷5×9). R. into F., 32—(o. d.÷4×9).

If below 0°F. F. into C.−(o. d.+32)÷9×5. F. into R.−(o. d.+32)÷9×4. C. into F.−(o. d.÷5×9)−32. R. into F. (o, d÷4×9)−32.

Q,—What two kinds of heat are used?

Dry heat and moist heat.

Q.—What is the general effect of heat?

In the first place it expands bodies, then overcomes cohesion to such extent that the body melts and becomes liquid, then finally overcoms cohesion entirely, and the liquid boils and passes into the gaseous state. (MITCHELL.)

Q.—How do we recognize heat?

By the effect which it produces in matter external to us, and also by our own sensations.

Q.—From whence is heat derived?

From mechanical sources, friction, compression and percussion; from physical sources, the sun, stars, radiation from the earth, and atmospheric electricity; and from chemical combinations, especially combustion. The fourth source, and that with which we are particularly concerned, is the changes which take place within the bodies of living organisms.

Q.—How does the physiological orgin of heat differ from that heat exernal to us?

The physiological origin is essentially chemical, while the latter is physical.

Q.—To what chemical process is the development of animal heat due?

To the process of oxidation; for in whatsoever organ or tissue oxygen becomes united to other chemical elements, heat is produced.

Q.—How is heat lost to the human body?

By work, radiation and conduction; a provision of nature to prevent its accumulation.

Q.—If the continuous production of heat is counterbalanced by its continuous dispersion, what amount remains as the normal temperature of the healthy many

About 98.6° F., any marked deviation from this point, either above or below, is indicative of disease.

Q.—What are the physiological effects of heat?

Different degrees of atmospheric heat are recognized by the terminal nerve fibres distributed to the skin. Dry heat is better borne than moist, and dry cold than moist cold. A moderate degree of heat relaxes muscular fibre. Reflex excitation leads to increased rapidity of the heart's action, with consequent acceleration of the pulse. Respiration and respiratory elimination is increased, and these conditions combine to favor rapid elimination and a slight actual decrease in body temperature is produced. A high degree of heat causes in the human being rapid, tumultuous, and irregular action of the heart; respiration is correspondingly quickened, the cutaneous blood vessels are distended, and the secretions checked. Chemical changes proceed with rapidity, the blood darkens and contains less oxygen, the albuminous constituents of the organism undergo fatty degeneration, and when the temperature of the body, as a whole, is raised 6° C. above normal, molecular decomposition occurs.

Q.—What are the different modes of applying heat?

Heat is applied both by moist and dry applications; by regulating the heat of the room, by changes of clothing, by baths, by currents of hot air, by poultices, counter-irritants, etc.

Q.—What is its therapy?

Warm applications are gratefully received by all painful and inflammatory conditions; dry heat is an important remedy in sudden and alarming depression of the vital powers, attacks of migraine, neuralgia of the fifth, tic-douloureux of mild form, etc. Spinal irritation, chronic rheumatism, and general dropsy, are also much relieved. As a styptic, under certain conditions, and as an adjunct to the absorption of antiseptic agents, heat is a serviceable assistant.

Q.—What is said of heat as a germicide?

When its application is possible, it is the most effective.

Q.—What are the Dental uses of heat?

In the laboratory and operating room its uses are many, and so generally manifest as to render description unnecessary. As a therapeutical agent, it is valuable in all acute inflammatory conditions, as an antiseptic and depletive. Dry heat has been used much of late as an agent for extracting moisture from pulp canals prior to filling, thus rendering them dry and deprived of one of the elements necessary to the existence of microbic life.

Q.—In the operation of root filling is heat applied for its direct antiseptic effect?

No, a sufficient degree cannot be applied; but by dessicating the dentine, it becomes possible to fill every portion of it with such agents as will prove permanently antiseptic.

Q.—How is heat applied in these cases?

Some times by a current of hot air, but most effectually by a heated wire, sufficiently attenuated to reach the apex.

EVACUANTS.

Q.—What are Evacuants?

Remedies which promote some evacuation from the body.

Q.—What classes of remedies are known as Evacuants?

Emetics, cathartics, anthelmintics, diuretics and emmenagogues.

Q.—How are emetics divided?

Into local and systemic emetics.

Q.—What is meant by local emetics?

Those agents which produce vomiting by virtue of a local action on the stomach, and do not effect the viscus when introduced elsewhere.

Q.—What is meant by systemic emetics?

Those agents which incite emesis when they enter the blood at any point.

Q.—Which are the most important of the local emetics?

Cupri Sulphas, *Sulphate of Copper*, gr. vj in water, every 15 minutes until emesis occurs; grs. xij may be given at one time in narcotic poisoning.

Zinci Sulphas, *Sulphate of Zinc*, gr. vj or viij in water, every 15 minutes until emesis occurs. Is less irritating than the copper salt.

Hydrargyri Subsulphas Flavus, *Yellow Subsulphate of Mercury*, Turpeth Mineral, gr. iij–v, in powder, with sugar of milk, is the best emetic in the group and is tasteless.

Alumen, Alum. A teaspoonful in honey every half hour. It is safe and efficient, but slow.

Sinapis Alba, vel Nigra. *White or black mustard*, as emetic, a teaspoonful or more in water. It stimulates the heart and circulation and is a condiment and carminative in small doses.

Scilla, *Squill.* Not employed alone as an emetic. The Comp. Syrup is used on account of the tartar emetic it contains. All of these agents have been or will be noticed in other parts of this work.

Q.—Which are the most important of the Systemic Emetics?

Apomorphine, *Apomorphina*, by stomach gr. ⅛–1-16, hypodermatically, gr. 1/16, in fresh solution. It is very depressant to the heart.

Antimonii et Potassii Tartras. *Tartar emetic*, as an emetic gr. j-ij. Is too slow and depressant.

Ipecacaunha. *Ipecac*, emetic, dose gr. xv–xxx. Action slow and repetition begets tolerance.

APOMORPHINA.=Apomorphine.

Q.—What is Apomorphine?

An alkaloidal derivative from morphine by the action of strong acids or zinc chloride.

Q.—What salt of Apomorphine is official?

The hydrochlorate.

Q.—What are its physical properties?

It is a whitish powder which becomes greenish by absorption of moisture.

Q.—In what is it soluble?

In water,

Q.—What is its dose?

By the stomach, gr. ⅛, hypodermatically $\frac{1}{16}$ (fresh solution).

Q.—What are its physiological properties?

A depressing emetic.

Q.—What is its therapy?

Used as an emetic when swallowing is deficient, and when very prompt action is necessary. It has also been given as an expectorant.

IPECACUANHA=Ipecac.

Q.—What is Ipecac?

It is the root of *Cephaelis Ipecacuanha*. (Nat. Ord. Rubiaceae) a Brazilian shrub.

Q.—What does it contain?

A crystalline alkaloid, *Emetine*, a glucoside Ipecacuanhic acid, also gum, starch, etc., and a trace of volatile oil.

Q.—What are the preparations of Ipecac?

Extractum Ipecacuanhae,	dose	♏j–v
Vinum Ipecacuanhae, (7 per cent.)		♏j–ʒj
Syrupus Ipecacuanhae, (5 per cent.)	ʒj–iv	

Pulvis. Ipecacuanhae et Opii, (Dover's powder.)
(Ipecac, 10, pulv. Opii 10, sugar of milk 80 parts,)
dose gr. ij–v

Tinctura Ipecacuanhae et Opii, (Liquid Dover's powder.)
(Deod. tinct. opii 10, Fl. ex. Ipecac 10, alcohol 80 parts,)
dose mij–xv

Emetina, *Emetine*, (unofficial). Dose as an expectorant gr. $\frac{1}{20}$-$\frac{1}{40}$. Dose as an emetic gr. ⅛-¼.

Q.—What are the physiological actions of Ipecac?

A nauseant emetic, expectorant, cholagogue, diaphoretic, hæmostatic, sternutatory, and counter-irritant. Locally applied to the skin or mucous membrane, it acts as an irritant and may cause pustulation.

Q.—What are the antagonists and antidotes?

The emetic action is antagonized by the narcotics generally, also by bismuth, carbolic and hydrocyanic acids. Incompatibles are salts of lead and mercury, vegetable acids and astringent infusions.

Q.—What is its therapy?

Used as a safe non-depressing, sure, though somewhat slow emetic, and in very small doses (♏j of tinct. or wine) as an anti-emetic. As an expectorant, antihæmorrhagic, and anti-dysenteric. Locally as a counter-irritant and pustulant.

Q.—What are its Dental uses.

In inflammatory conditions of the oral tissues, combined with opium it has rendered service. In the diarrhea of teething children and in cases of hæmophilia.

Give formulae.

For Diarrhea.

℞ Ipecacuanhæ,	gr. xij.
Bismuthi Subcarb,	ʒj.
Pepsini Sacch,	ʒss.

M. Ft. pulv. No. xij.
Signa: One in milk every two hours.

[BARTHOLOW.]

As an Anti-hemorrhagic.

℞ Fl. Ex. Ipecac,	fʒij.
Fl. Ex. Ergotæ,	fʒiv.
Fl. Ex. Digitalis,	fʒij.

M. Signa. xxx to ♏ʒj a dose as required.

[BARTHOLOW.]

CATHARTICS.

Q.—How are Cathartics subdivided?

Into laxatives; simple, saline, drastic, hydragogue, and cholagogue purgatives.

Q.—What are Laxatives?

Agents which stimulate intestinal movements without materially increasing the secretions. Sulphur is the type.

Q.—What are Simple Purgatives?

Agents which cause active peristalisis, and some irritation and griping. Senna is the type.

Q.—What are Saline Purgatives?

Agents which increase peristalsis, promote osmosis, stimulate the glands, and thus produce free watery evacuations. Epsom salts is the type.

Q.—What are Drastic Purgatives?

Agents which act still more intensely, causing large watery stools, much griping pain, and tenesmus. Jalap is the type.

Q.—What are Hydragogue Purgatives?

This group includes the most active of the drastics and salines; they remove a large quantity of water from the vessels. Croton oil is the type.

Q.—What are Cholagogue Purgatives?

Agents which stimulate the flow on the bile, causing green colored, or "billious" stools. Podophyllin is the type.

Q.—What agents are Laxatives and Purgatives?

LAXATIVES:

Carbonate of Magnesia.
Cassia.
Castor Oil.
Figs.
Honey.
Magnesia.
Ox-Gall.
Manna.
Olive Oil.
Prunes.
Sulphur.
Tamarinds.
Treacle.

Q.—What agents are Simple Purgatives?

Cloves.
Buckthorn-juice.
Cascara Sagrada.
Jalap.
Rhubarb.
Senna.

Q.—What agents are Saline Purgatives?

Citrate of Magnesia.
Cream of Tartar.
Phosphate of Soda.
Sulphate of Magnesia.
Sulphate of Potash.
Sulphate of Soda.
Tartrate of Potash.
Tartrated Soda.

Q.—What agents are Drastic Purgatives?

Colocynth.
Croton Oil.
Gamboge.
Jalap.
Podophyllin.
Scammony.

Q.—What agents are Hydragogue Purgatives?

Cream of Tartar.
Gamboge.
Elaterin.

Q.—What agents are Cholagogue Purgatives?

Aloes.
Blue Pill.
Podophyllin.
Taraxacum.
Gray Powder.
Calomel.
Colchicum.
Euonymin.

MANNA. What is it?

The concrete saccharine exudation of *Fraxinus ornus* (Nat. Ord. Oleaceæ.)

Q.—What does it contain?

Mannite, a sugar, and a resin.

Q.—What is its dose?

ʒj to ℥ij according to age.

TAMARINDUS. What is Tamarind?

The preserved pulp of the fruit *Tamarindus Indica* (Nat. Ord. Leguminoseæ). Used in confection Sennæ, dose indefinite.

OLEUM RICINI. What is *Castor Oil?*

A fixed oil expressed from the seed of *Riciuus Communis* (Nat. Ord. Euphorbiaceæ), a plant originally from India.

Q.—What is its dose?

From fʒj to f℥j.

Q.—How do fruits generally produce laxative effects?

Many of them through the mechanical stimulation of intestinal peristalsis by their small, indigestible seeds.

FEL. BOVIS. What is Fel. Bovis?

Fresh Ox Gall.

Q.—What are its physical properties?

A greenish-brown, viscid liquid, with a peculiar nauseating odor and bitter, offensive taste. Its solution froths when shaken and saponifies fats, reaction alkaline, sp. gr. 1018 to 1028.

Q.—What are its preparations?

Fel. Bovis Inspissatum,	dose gr. v–viij, in pill.
Fel. Bovis Purificatum,	dose gr. iij–vi, in pill.

SENNA. What is Senna?

The leafletts of *Cassia Acutifolia*, and *Cassia Elongata*, (Nat Ord. Luguminoseæ and Cæsalpinieæ).

Q.—What are its principle constituents?

Cathartic Acid, a glucoside; and *Sennacrol*, *Sennapicrin*, bitter principles; *Catharto-mannite*, a sugar.

Q.—What are its preparations?

Exsractum Sennæ Fluidum,	dose vf℥ss
Confectio Sennæ,	dose fʒj–iv
Syrupus Sennæ,	dose fʒj–f℥j

RHEUM. What is Rhubarb?

The root of *Rheum Officinale* (Nat. Ord. Polygonaceæ) and other species. Its habitat is China.

Q.—What does it contain?

Phæoretin, a purgative resin; *Chrysophanis*, *Rheotannic*, and *Rheumic Acids* and *Chrysophan*, a glucoside.

Q.—What are its preparations?

Extractum Rhei,	gr. x–xv
Pilulæ Rhei,	j–iij
Extractum Rhei Fluidum,	fʒss–ij
Pilulæ Rhei Compositus,	ij–iv

Pulvis Rhei Compositus (Gregory's Powder),	ʒss–j
Syrupus Rhei,	fʒj for a child.
Syrupus Rhei Aromaticus,	f℥ss
Tinctura Rhei,	f℥ss
Tinctura Rhei Aromaticus,	fʒj–vj
Vinum Rhei,	fʒj–iv

Aloe. What is Aloes?

The inspissated juice of the leaves of *Aloe Socotrina* (Nat. Ord. Liliaceæ).

Q.—What does it contain?

Aloin, or *Socaloin*, a volatile oil and a resin.

Q.—What are its preparations?

Aloe Purificata,	gr. j–x
Pilulæ Aloës, et Asafœtida,	ij–v
Tinctura Aloës,	fʒss–f℥j
Pilulæ Aloës,	j–v
Extr. Aloës Aquosum,	gr. ss–vj
Tinct. Aloës et Myrrhæ,	fʒss–ij
Pilulæ Aloës et Ferri,	gr. j
Pilulæ Aloës et Mastiches (Lady Websters).	
Aloin (B. P.),	gr. $\frac{1}{10}$–ij

Cascara Sagrada. What is it?

Sacred bark, if the bark of the California buckthorn *Rhamus Purshiana* (Nat. Ord. Rhamnaceæ).

Q.—What does it contain?

Several resinoids, brown, red, and yellow; tannic, malic, and oxalic acids; a neutral crystallizable substance; a volatile oil; wax, starch, and a fat oil.

Q.—What are its preparations?

None are official in the U. S. P., in B. P.

Extr. Cascaræ Sagradæ,	gr. ij–x
Extr. Cascaræ Sagradæ Fl.,	ʒss–ij

Jalapa. What is it?

The tuberous root of *Exogonium purga* (Nat. Ord. Convolvulaceæ), a Mexican plant.

Q.—What does it contain?

From 13 to 18 per cent. of resin, which is official and is composed of *Jalapin* and *Convolvutin*, also starch and sugar.

Q.—What are its preparations?

Abstractum Jalapæ,	gr. j-iij.
Resina Jalapæ,	gr. ij-v.
Pulvis Jalapæ Compositus,	gr.j-x.

SCAMMONIUM. What is it?

Scammony is a resinous exudation from the root of *Convolvulus Scammonia.* (Nat. Ord. Convolvulaceæ).

Q. What does it contain?

A resin (about 80 per cent.) which consists chiefly of *Jalapin.*

Q. How does this Jalapin differ from that obtained from Jalap?

It is soluble in Ether while that from Jalap is not.

Q. By what other name is it known?

Scammonin.

Q. What are its preparations?

Resinæ Scammonii,	dose gr. v-x.

It is a constituent of the Comp. Ex. of Colocynth.

OLEUM TIGLII. What is it?

Croton Oil, a fixed oil expressed from the seed of *Croton Tiglium.* (Nat. Ord. Euphorbiaceæ.) an East Indian tree of moderate size.

Q.—What does it contain?

Several fatty and volatile acids, one of which is called *Tiglinic acid* another *Crotonic acid.*

Q.—In what is it soluble?

When fresh, it is soluble in about 60 parts of Alcohol; the solubility and therapeutic activity increase by age. Freely soluble in ether, chloroform, olive oil, and oil of terpentine.

Q. What is its dose?

From gtt. $\frac{1}{3}$ to ij, in pill of bread crumb.

CAMBOGIA. What is it?

Gamboge is a gum resin from *Garcinia Hanburii* (Nat. Ord. Guttiferæ) from Siam.

Q.—What does it contain?

About $\frac{1}{4}$ gum and $\frac{3}{4}$ resin termed *Gambogic Acid.*

Q.—What are its preparations?

It has no official preparations, and is never given alone, but is a constituent of compound cathartic pill.

COLOCYNTHIS. What is it?

Colocynth is the fruit of *Citrullus Colocynthis* (Nat. Ord. Cuburbitaceæ) "the bitter cucumber," deprived of its rind.

Q.—What does it contain?

An active purgative glucoside, *Colocinthin*; also *Colocinthitin*, which is soluble in ether, insoluble in water, and not purgative.

Q.—What are its preparations?

Extr. Colocynthidis,	gr. j-v not used alone.
Extr. Colocynthidis, Comp.,	gr. v-x.
Pilulæ Catharticæ Comp.,	i-iij - each has of the preceding gr. 13-10; Abs. jalap gr. j; Calomel gr. j and gamboge gr. ¼

ELATERINUM. What is it?

Elaterin is a neutral principal trom *Elaterium* a substance deposited by the juice of the fruit of *Ecballium Elaterium*, (Nat. Ord. Cucurbitaceæ) "the squirting cucumber."

Q.—What is its dose?

From gr. $\frac{1}{30}$ to $\frac{1}{10}$ in pill or trituration.

Q.—What preparation is official?

Trituratio Elaterini (10 per cent.),	gr. ss-j

PODOPHYLLUM. What is it?

May-apple, the rhizome and rootlets of *Podophyllum peltatum*. (Nat. Ord. Berberidaceae). U. S. and Canada.

Q.—What does it contain?

The alkaloid Berberine (?) and two resins.

Q.—What are its preparations?

Abstractum Podophylli,	gr. ⅛–j
Extractum Podophylli,	gr. v–x
Extractum Podophylli, Fluidum,	m v–xxx
Resina Podophylli,	gr. ¼–j

(Podophyllin is an eclectic term for the last mentioned.)

Euonymus. What is it?

Wahoo, the bark of *Euonymus atropurpureus*. (Nat. Ord. Clastraceæ.)

Q.—What does it contain?

A bitter principle *Euonymin*, also resins, an oil, etc.

Q.—What is its dose?

Extractum Euonymi. gr j–v

Taraxacum. What is it?

Dandelion, the root of the *Taraxacum Dens-leonis*. (Nat. Ord. Compositæ.) America and Europe.

Q.—What are its preparations?

Ext. Taraxaci,	grs. v–xxx
Ext. Taraxaci Fl.,	fʒj–f℥j

Q.—For what is it used in medicine?

Principally as an hepatic stimulant and as an exeipient for making pills. (The other purgatives have been noticed under different heads.)

Q.—By what other means is the contents of the bowels evacuated?

By means of Enemas, and irritating suppositories.

ANTHELMINTICS.

Q.—What are Anthelmintics?

Remedies to destroy or expel the various forms of worms which infest the system.

Q.—What worms are found in the alimentary canal?

Tape-worms, round worms, and seat-worms.

Q.—How may these entozoa be destroyed?

Either by remedies acting through the system, or by rectal injections.

Q.—What routine should be observed in the adminministration of Anthelmintics?

The alimentary canal should be empty at the time they are given, and should be followed by a brisk purgative.

Q.—What remedies are principally employed to destroy tape-worms?

Male fern, turpentine, pumpkin seeds, koosso, kamala and pomegranate.

Q.—Which are directed more especially against the round-worms?

Santonine, pink root, azedarach, and worm seed.

Q.—How are seat-worms destroyed?

By rectal injections of quassia, alum, salt, aloes, and carbolic acid.

Aspidium. What is it?

Male Fern. It is the root of the *Aspidium filix-mas* (Nat. Ord. Filices), a European plant.

Q—What does it contain?

Oils, resin, tannin, etc. The ethereal extract deposits a crystalline substance, *Filicic acid*, on which the medicinal activity depends.

Q.—What is its preparation?

Oleo-resina Aspidii, dose ʒss–ij

Q.—For what is it used?

For expelling and perhaps destroying tænia.

Q.—Give formula?

℞	Oleo-resinæ aspidii,	fʒj
	Olei terebinthinæ,	f℥j
	Vitellum Ovum,	ij
	Olei ricini,	f℥j

M. Signa: Take at once after fasting and follow with a purgative.

Q.—In what dose is turpentine administered as a vermifuge?

Half an ounce may be given mixed with twice that amount of castor oil.

Q.—How are Pumpkin-seeds administered for the destruction of tape-worm?

Two ounces are beaten up with sugar and water and taken in the form of an emulsion early in the morning.

KAMALA. What is it?

The glands and hair from the fruit of *Mallotus Phillipinensis* (Nat. Ord. Euphorbiaceæ); India and China.

Q.—In what form does it occur?

As a red, inflammable powder.

Q.—How is it administered?

In the form of a tincture, or given in syrup in doses of from one to two drachms,

BRAYERA. What is it?

Koosso. It is the female inflorescence of *Brayera Anthelmintica* (Nat. Ord. Rosaceæ), a tree of Abyssinia.

Q.—What are its active principles?

A resin (Koossin), Tannic acid, and Volatile oil.

Q.—What are its preparations?

Extractum Brayeræ Fl.,	♏xx–fʒij
Infusum Brayeræ [6 per cent.]	f℥iv to viij
Koosin [unofficial]	gr. v–xx

Q.—How is it administered?

An emulsion may be made of the infusion with castor oil, yolk of eggs, ether, and oil of anise, combined with ten or twenty drops of the Oleoresin of Male Fern. Should not be given during pregnancy.

GRANATUM. What is it?

Pomegranate. The bark of the root of *Punica Granatum* (Nat. Ord. Granataceæ), cultivated in subtropical countries.

Q.—What does it contain?

A liquid alkaloid, *Pelletierine*, and Punico-tannic acid.

Q.—What are its preparations?

None official. Unofficial:—

Extractum Granati Fl.,	fʒss-iss
Decoctum Granati,	f℥ij-iv
Pelletierina Tannas,	gr. ss-j

Q.—How is it administered?

Best in decoction followed by a purgative,

Santonica. What is it?

Levant, or German worm seed, is the unexpanded flower heads of *Artemisia Maritima* [Nat. Ord. Compositæ].

Q.—What do they contain?

Resin, malic acid, essential oil, and a crystalline principle, *Santonin*.

Q.—What are its preparations?

Santoninum,	gr. ¼-ij
Sodii Santoninas,	gr. ij-x
Trochisci Sodii Santoninatis, unofficial, each containing gr. j of the Soda Salt,	j-iv
Extractum Santonicæ,	gr. ij-viij
Extractum Santonicæ Fl.,	♏ viij-xxx
Trochisci Santonini Worm Lozenges (each gr. ss),	i-iv

Q.—What is the physiological action of Santonin?

In large doses it causes free salivation, convulsions, cramps, unconsciousness, with acceleration of the breathing and slowing of the pulse.

Q.—Has it proved fatal?

Yes. Two grains killed a child five years old.

Q.—Upon what kind of worms is its action most noted?

The round and thread worms.

Q.—What is the objection to its use?

It is unsafe for young children, acts very slowly and the first dose should not be repeated too soon.

Q.—What symptoms have been observed in santonin poisoning?

Great pallor, convulsive tremblings, vomiting, colicky pains, dilation of the pupils, unconsciousness, and sudden death.

Q.—What is the treatment for poisoning?

Diffusible stimulants, hot baths, demulcent drinks, belladonna, and strychnine with ether to control convulsions.

Give formulæ.

℞	Santonini,	gr. iij
	Hydrarg Chlor. Mitis,	gr. vi
	Sodii bicarb.,	gr. xij

M. et div. in chart No. vj.
Signa: Give one each night to a child six years old.
(SHOEMAKER.)

SPIGELIA. What is it?

Pink Root, is the rhizome and rootlets of *Spigelia marilandica.* [Nat. Ord. Loganiaceæ]. Southern United States.

Q.—What does it contain?

A bitter principle, volatile oil, resin, etc.

Q.—How does it act as a vermifuge?

By narcotizing the worm and rendering its expulsion easy by subsequent catharsis.

Q.—What preparation is official.

Extractum Spigeliæ Fl.,	Dose, fʒj–ij.

Q.—Against what worms is its action especially directed?

The round worms.

Give formula.

℞	Spigcliæ.	℥ss.
	Sennæ,	ʒij.
	Sem. Fœniculi,	ʒij.
	Mannæ,	℥j.
	Aquæ bullientis,	Oj.

M. et. ft. infusum.
Signa. Dose, for a child, one or two tablespoonfuls; adult, a wine glassful or two.
(SHOEMAKER.)

AZEDARACH. What is it?

(Pride of China.) It is the bark of the root of *Melia Azedarach.* (Nat. Ord. Meleaceæ). Southern United States.

Q.—How is it used?

As a decoction (℥iv. to Oij, boiled down to Oj), as being given to a child every two or three hours until the bowels are freely moved, as a vermifuge.

CHENOPODIUM. What is it?

Worm seed; it is the fruit of *Chenopodium ambrosiodes*, variety anthelminticum. (Nat. Ord. Chenopodiaceæ). North America and Europe.

Q.—By what common name is this plant known.

Jerusalem oak.

Q.—What does it contain?

A peculiar volatile oil, a thin, yellowish, offensively aromatic liquid, which is official.

Q.—What is its preparation?

Oleum Chenopodii, gtt. v-xx.

Q.—How is it administered?

On sugar, three times a day, followed on the second day by a brisk cathartic.

Chloroform is sometimes used as a taenia-fuge, and with very great success in ʒj doses in ℥j of mucilage, for an adult, followed by ℥j of castor oil.

DIURETICS.

Q.—What are Diuretics?

Agents which increase the renal secretion.

Q.—How do they act?

Either by raising the general or local blood pressure, by stimulating the nerves or cells of the kidneys, or by flushing those organs and washing them out.

Q.—How are Diuretics usually divided?

Into refrigerant, hydragogue, and stimulating diurerics.

Q.—What agents are usually classed as Refrigerant Diuretics?

The potasium ssalt, especially the acetate, bi-tartrate, carbonate,, citrate, chlorate and nitrate.

Spiritus ætheris nitrosi, digitalis, scilla, scoparius, strophanthus, cimicifuga, convallaria, cocaine, caffeine and hydrargyrum.

Q.—What agents are usually classed as Stimulating Diuretics?

Apocynum, buchu, capsicum, chimophila, copaiba, cubeba, damiana, hydrangea, juniperus, kava-kava, manaca, matico, pareira, piper, stigmata maydis, Taraxacum and uva ursi.

SPIRITUS AETHERIS NITROSI. What is it?

Sweet spirits of nitre, is an alcoholic solution of crude ethyl nitrite (5 per cent).

Q.—How is it made?

By the action of sulphuric and nitric acids upon stronger alcohol.

Q.—Of what does it consist?

Chemically of alcohol, aldehyd, water, ethyl acetate, and pure ethyl nitrite.

Q.—How does it act upon the human system?

As a diaphoretic and diuretic.

Q.—How is it generally employed?

As an adjuvant to more powerful agents of the same class

Q.—What is its dose?

As a diuretic from fʒij–iv.

APOCYNUM. What is it?

Canadian hemp, is the root of *Apocynum canabinum*. (Nat. Ord. Apocynaceæ) indigenous plant.

Q.—What does it contain?

Apocynin and *Apocynein*, the former soluble in alcohol, the latter in water.

Q.—What is the dose of Apocynum?

From gr. v–xx.

BUCHU. What is it?

The leaves of *a Brosma Crenulata*. (Nat. Ord. Rutaceæ) and of other varieties. South America.

Q.—What does it contain?

A volatile oil, and mucilage.

Q.—What are its preparations?

Extr. Buchu Fl.,	♏x–fʒj
Infusum Buchu,	f℥ij

Q.—What effect has Buchu on the kidneys?

It acts as a diuretic, stimulant, and alterative to the mucous membrane.

For what is it employed in medicine?

In chronic affections of the genito-urinary tract, e. g. pyelitis, cystitis, and irritable bladder, and as a vehicle for saline diuretics.

CAPSICUM. What is it?

Cayenne pepper, the fruit of *Capsicum Fastigiatum* (Nat. Ord. Solanaceæ,) dried and pulverized.

Q.—What does it contain¿

Capscicin, a peculiar liquid principle, also a volatile oil.

Q.—What are its preparations?

Extr. Capsici fl.,	♏ j–v
Oleoresina Capsici, (20 per cent.)	♏ 1-20–ij
Tinctura Capsici,	♏ v–fʒij
Eplastrum Capsici. (10 per cent.)	
Infusum Capsici, (Gargle.)	

Q.—What are its physiological actions?

As a stimulant, irritant, and vesicant; and as a diuretic.

What are its therapeutic uses?

As a tonic to the gastric membrane, especially in drunkenness, as an external irritant in lumbago and renal congestion, and as a stimulating ingredient of gargles, etc.

Q—What are its Dental uses?

As a stimulating application to the gums, either in the form of the tincture or plaster, and as ingredient of mouth washes, gargles, etc.

Q.—For what pathological conditions is Capsicum recommended?

In the early stages of acute pericementitis, or periodontitis and in the chronic stages to resolve inflammatory products; in chronic ulceration, etc., in salivation, abscesses, recessions, caries and diseases of the antrum; for the relief of neuralgias, following extraction, etc.

Q.—What is the most convenient form of direct application?

Bags or plasters.

Give a formula.

For a Tooth Wash.

℞	Tinct. Capsici,		fʒij
	Spiritus Odorat,		
	Alcoholis,	āā	f℥ij
	Tinct. Quillaiæ,		f℥iss
	Tinct. Gentianæ Comp.		f℥j
	Acidi Acetici dilute,		f℥ss
	Acidi Carbolici,		♏ij
M.			(GARRETSON.)

CHIMAPHILA. What is it?

Pipsissewa, or prince's pine, is the leaves of *Chimaphila umbellata* (Nat. Ord. Ericaceæ.)

Q.—What does it contain?

Tannin, and a colorless, bitter, crystalline, neutral principle, *Arbutin*. Also a colorless, tasteless substance in yellow crystals, *Chimaphilin*.

Q.—What is its physiological action?

Astringent, tonic and diuretic.

Q.—For what is it used?

As a diuretic in dropsy, albuminuria and chronic affections of the genito-urinary tract.

Q.—What are its preparations?

Ext. Chimaphilæ Fl.	fʒss-j
Decoctum Chimaphilæ,	f℥j-iij

COPAIBA. What is it?

An oleoresin obtained from the *Copaifera Multiiuga Langsdorffii* (Nat. Ord. Leguminoseæ) and other species of Copaifera. Brazil.

Q.—What are its physical characteristics.

It is not a balsam; it is a clear transparent, oily liquid, of a pale straw color, with a characteristic unpleasant taste and odor.

Q.—What does it contain?

A large quantity of volatile oil, in which two resins are dissolved.

Q.—Which is the more important?

Copaibic acid, insoluble in water, soluble in absolute alcohol and ammonia.

Q.—What are its preparations?

Massa Copaibæ,	gr. x-ʒss
Oleum Copaibæ,	♏v-x
Resina Copaibæ,	gr. viij-xv

Q.—What is its physiological action?

Locally, it is irritant, causing itching and the appearance of an eruption. Internally it is a gastro-intestinal irritant, causing nausea, diarrhea, unpleasant eructation and inflammation of the genito-urinary tract, with scanty urine, albuminuria and blood casts.

Q.—What are its therapeutic uses?

Used in subacute and chronic gonorrhœa and chronic inflammation of the genito-urinary tract, also in

CUBEBA. What is it?

The unripe berries of *Cubeba officinalis*. (Nat. Ord, Piperaceæ.) Java.

Q.—What do they contain?

A volatile oil, an acrid resin composed in part of *Cubebic acid*, also a fatty oil, gum and *Cubebin*, which is an insoluble, neutral, odorless and tasteless body.

Q.—What are the active principles of the plant?

The volatile oil and the Cubebic acid, both of which are contained in the oleoresin.

Q.—What are its preparations?

Extr. Cubebæ fl.,	♏v-xxx
Tinctura Cubebæ [10 per cent.],	♏x-ʒiij
Oleoresina Cubebæ,	♏v-xxx
Trochisci Cubebæ,	i-iij
Oleum Cubebæ,	♏v-xx

Q.—What is the physiological action of Cubebs?

Belongs to the pepper family and is an aromatic stomachic and stimulating diuretic.

Q.—For what is it used?

Principally like copaiba, with which it is often combined in the form of lozenges, by public speakers, for its tonic effect on the larynx and vocal cords; and in the form of snuff to check nasal discharges in coryza.

DAMIANA. (Unofficial.) What is it?

The leaves of *Turnera Aprodisiaca.* (Nat. Ord. Turneraceæ) Mexico and California.

Q.—What does it contain?

A volatile oil and a resin.

Q.—What are its preparations?

(Non-official.)

Extr. Damianæ,	gr. v–xx
Extr. Damianæ fl.,	fʒss–iv
Glycerol Damianæ Pnosphorici et., Nucis Vomicæ,	fʒj
Elixir Damianæ,	fʒij-f℥j

Q.—What is the physiological action?

A stimulating aphrodisiac, tonic, cathartic, and diuretic.

Q.—For what is it used?

To stimulate the sexual functions and as a tonic in dyspepsia, neuralgia, cerebral exhaustion and neurasthenia. It is the principal ingredient of many nostrums known as "manhood restorers."

HYDRANGEA. (Unofficial.) What is it?

The root of *Hydrangea Arborscens.* (Nat. Ord. Saxifragaceæ.) South Eastern United States.

Q.—What does it contain?

Gum, albumen, starch, resin and a ferrous salt, with other salts.

Q.—What are its preparations?

Extr. Hydrangeæ fl.,	♏xxx-fʒj

It may also be used in decoction.

Q.—What are its medicinal uses?

In gravel and renal colic.

JUNIPERUS. What is it?

The fruit of *Juniperus communis.* (Nat. Ord. Coniferæ.) Northern Europe.

Q.—What does it contain?

A volatile oil and a non-crystallizable principle, *Juniperin*; also grape sugar, resin, formic, acetic and malic acids, etc.

Q.—What are the preparations of Juniperus?

Oleum Juniperi,	♏v–xx
Spiritus Juniperi,	fʒj–f℥j
Spiritus Juniperi Comp.,	fʒij–iv
Infusum Juniperi, (Unofficial,)	f℥ij–iv
Oleum Cadini,	
Spiritus Genevæ, *Gin*,	fʒj–f℥j

Q.—What is the physiological action of Juniper?

As a tonic to the stomach, kidneys, and genito-urinary tract. In large doses it causes suppression of the urine, strangury, and convulsions.

Q.—What are its uses?

To flavor gin, and as a stimulating diuretic in chronic conditions of the genito-urinary tract not marked by acute inflammations. The spirit and compound spirits are used as vehicles for other diuretics.

Q.—How is the oil of Cade obtained?

By the destructive distillation of Juniper wood.

Q.—What are its physical characteristics?

It is tarry and empyreumatic.

Q.—For what is it used?

As a stimulating application in chronic eczema and psoriasis.

KAVA-KAVA. What is it?

(Unofficial.) It is the root of *Piper methysticum*

(Nat. Ord. Piperaceæ), South America and the South Sea Islands.

Q.—What does it contain?

A soft resin (two kinds, a and b), and some yellow volatile oil, and a crystalline principle, *methisticin* (or Kavahin).

Q.—What is its dose?

♏xv–ʒss; best in form of fluid extract.

Q.—What are the physiological actions and uses?

Intoxicant, diuretic and motor depressant. A moderate dose is tonic and stimulating. Highly recommended in gout, gonorrhœa, gleet and cystitis.

MANACA. What is it?

Unofficial, it is the root of *Franciscea uniflora* (Nat. Ord. Scrophulariaceæ). Brazil, where it is known as vegetable mercury. Very little is known of this substance, but it is advertised as a purgative, diuretic, emmenagogue and anti-syphilitic, but especially as a remedy for acute and chronic rheumatism. Dose of fl. ex. ♏v–ʒj several times each day.

MATICO. What is it?

The leaves of *Artanthe elongata* (Nat. Ord. Piperaceæ), of South America.

Q.—What does it contain?

A volatile oil (1½ per cent.), a resin, a bitter principle termed *Maticin*, Artanthic acid, and tannin.

Q.—What are its preparations?

Extractum Matico Fluidum,	dose ♏xx–fʒij
Tinctura Matico,	dose fʒj–℥j
Extractum Matico,	dose gr. ij–xij

Q.—What are its physiological actions?

Matico is an aromatic tonic and stimulant, also aphrodisiac, vulnerary and hæmostatic. It acts like cubebs on the urinary passages and is an excellent alterative stimulant to mucous membranes.

Q.—What are its therapeutic uses?

It has been used with success in nasal catarrh, also in epistaxis, hæmorrhoids, menorrhagia, hæmatemesis and other hemorrhages.

PAREIRA. What is it?

The root of *Chondodendron tomentosum.* (Nat. Ord. Menispermaceæ.) Of Brazil.

Q.—What does it contain?

A bitter, tonic alkaloid, *Buxine*; also called *Cissampeline.*

Q.—What are its preparations?

Pareira (In Infusion),	dose	ʒss-j
Extractum Pareira Fluidum,		fʒss-j

Q.—What are its physiological actions?

Slightly tonic, diuretic and laxative.

Q.—What are its therapeutic uses?

Used in the treatment of irritable bladder, cystitis, pyelitis, chronic urethritis and leucorrhœa.

PIPER. What is it?

Black pepper, and is the unripe fruit of *piper-nigrum.* (Nat. Ord. Piperaceæ), a vine growing in India, Siam, Java, Borneo, etc.

Q.—What does it contain?

The alkaloid *piperine*, a resin and an essential oil.

Q.—What are its preparations?

Oleoresina Piperis,	dose	♏ ¼–j
Piperine,		gr. j–x

Q.—What are its physiological actions?

Locally it is irritant; internally it is carminative, a stimulant, diuretic, antiperiodic and antipyretic.

Q.—What are its therapeutic uses?

Chiefly to correct flatulence and to excite the action of the stomach, occasionally employed in gleet, hæmorrhoids and other rectal diseases.

Stigmata Maydis. What is it?

Corn silk. (Unofficial.)

Q.—What are its properties and uses?

It is diuretic, demulcent and antiseptic, and is recommended in cystitis, is a mild diuretic in cardiac and renal affections, and as a corrective of nocturnal incontinence of urine.

Q.—What is its dose?

Of the Fluid Extract,	fʒj–ij

Taraxacum. What is it?

The root of Taraxacum Dens-leonis. (Nat. Ord. Compositae) or dandelion. America and Europe.

Q.—What does it contain?

Two principles, *Taraxacein and Taraxacerine* with potassium and calcium salts, *Inulin* and resins.

Q.—What are its preparations?

Extractum Taraxaci,	dose gr. x-xL
Extr. Taraxaci Fluidum,	fʒj-ij

Q.—What are its physiological actions?

A bitter tonic, diuretic and laxative.

Q.—What are its uses?

Used chiefly in dyspepsia with hepatic torpor, and as an excipient for pills.

Uva Ursi. What is it?

The leaves of *Arctostaphylos Uva-ursi.* [Nat. Ord. Ericaceæ), or bear-berry. North America and Europe.

Q.—What does it contain?

Tannin and gallic acids, and three principles, *Arbutin*, *Ericolin* and *Ursone*.

Q.—What are its preparations?

Extractum Uva Ursi Fluidum,	dose fʒss–j
Decoctum Uva Ursi (1-17),	dose f℥ss–ij

Q.—What are its physiological actions?

Astringent, carminative, tonic and diuretic.

Q.—What are its therapeutic uses?

Used in irritation of the bladder, strangury, dysuria, etc., and has some reputation in calculous affections.

EMMENAGOGUES.

Q.—What are Emmenagogues?

Measures and remedies which restore the menstrual function.

Q.—How do they effect this?

By acting as tonics, where scanty menstruation is due to debility; as depletives, where plethora is the cause; or by stimulating the uterine membrane directly.

Q.—How are Emmenagogues divided?

As Tonic, Purgative and Stimulating Emmenagogues.

Q.—What are the principal Tonic Emmenagogues?

Iron, Strychnine, and the other remedies which give tone to the system.

Q.—Which are the Purgative Emmenagogues?

Aloes, Helleborus Niger, and the drastic purgatives.

Q.—Which are the Stimulating Emmenagogues?

Savine, Rue, Tansy, Parsley, Cantharides, etc.

Q.—What are Oxytocics, or Ecbolics?

Agents which produce abortion.

Q.—How do they usually act?

By stimulating the gravid uterus to contract upon its contents.

NOTE.—For a description of drugs mentioned under this head and not elsewhere noticed, the student is referred to larger works.

TOPICAL REMEDIES.

Q.—What agents are classed as Topical Remedies?

Irritants.
Caustics, or Escharotics.
Local Sedatives.
Emollients and Demulcents.
Local Astringents and Styptics, and Protectives.

Q.—What are Irritants?

Substances which, when applied to the skin, produce a greater or less degree of vascular excitement.

Q.—What are counter-irritants?

Irritants used to produce a reflex influence on a part remote from their site.

Q.—How are Irritants divided?

Into Rubifacients, Epispastics, and Suppurants. (See Ante page 38).

Q.—What agents are classed as Rubefacients?

Mustard, capsicum, camphor, ammonia, mezereon, arnica, alcohol, ether, chloroform, iodine, menthol, oil of cajuput, oil of turpentine, volatile oils, pitch, friction, hot water.

Q.—What agents are classed as Epispastics?

Cantharides, euphorbinum, mezereon, iodine, rhus toxicodendron, ammonia (the confined vapor), glacial acetic acid, volatile oil of mustard, heat boiling water, or Corrigan's hamner).

Q.—What agents are classed as Suppurants?

Croton oil, tartar emetic, ipecacuanha, silver nitrate.

Q.—What agents are classed as Escharotics?

Mineral acids, chromic acid, carbolic acid, glacial acetic acid, arsenious acid, antimony chloride, caustic potasa, caustic soda, lime, dried alum, silver nitrate, copper sulphate, mercuric chloride,. mercuric oxide, mercuric nitrate, zinc sulphate, zinc chloride, bromine.

NOTE.—For a description of astringents see article under that head.

Q.—What is the difference between Styptics and Hæmostatics?

Styptics are applied locally and hæmostatics are administered internally.

Q.—What agents are classed as Styptics?

Acids, alum, cautery, collodion, ferric chloride, ferric sulphate, silver nitrate, cold, matico, spider's web, tannic acid, lead acetate, zinc sulphate, vegetable astringents.

Q.—What agents are classed as Hæmostatics?

Ergot, digitalis, gallic acid, lead acetate, dilute sulphuric acid, ipecacuauha, hamamelis, oil of turpentine.

Q.—What are Emollients?

Substances which soften and relax the tissues to which they are applied.

Q.—How do they act?

They relieve tension, dilate vessels and diminish pressure on the nerves, and protect inflamed surfaces from the air and from friction.

Q.—What agents are usually classed as Emollients?

Hot fomentations, poultices, glycerin, lard, linseed oil, olive oil, spermaceti, almond oil, petroleum, soap liniment, starch, cacao butter.

Q.—What are demulcents?

Substances generally of a mucilaginous nature, which sooth and protect the parts to which they are applied. This term is generally used for substances employed upon mucous membranes, and the term *Emollients* for similar agents used on the skin.

Q.—What agents are usually classed as Demulcents?

Acacia, cetraria, barley, liquorice, starch, glycerin, flaxseed, gelatin, honey, marsh-mallow, white of egg, almond oil, olive oil, isinglass, tragacanth, bland oils, lanolin.

Q.—What are Protectives?

Agents of a mechanical nature, employed to cover and protect an injured part from the air, water, etc.

Q.—What agents are classed as Protectives?

Collodion, gutta-percha, plasters and cotton wool.

ACACIA. What is it?

Gum arabic, a gummy exudation from *Acacia verek* and other species. (Nat. Ord. Leguminosæ.) A small African tree.

Q.—In what is it soluble?

In water, but not in alcohol.

Q.—What are its preparations?

Mulicago Acaciæ, dose indefinite. Acacia, 34; water, 100 parts.
Syrupus Acaceæ, dose indefinite. Of the mucilage, 25; syrup, 75.

Q.—What is its action, and for what is it used?

Gum Arabic has no activity except the negative one of a demulcent, and is chiefly used in coughs, sore throats, catarrhal inflammations of the stomach and intestine, and irritant poisoning.

CANTHARIS.—Cantharides, Spanish Flies.

Q.—What is Cantharis?

The dried beetle, *Cantharis vesicatoria*, an insect of the (Nat. Ord. Coleoptera), about an inch long, of a showy green color, the powder being grayish brown, with green particles and a disagreeable odor.

Q.—What does it contain?

Cantharadine $C_{10}H_{12}O_4$, the active principle, also a greenish volatile oil and peculiar fatty bodies.

Q.—What are its preparations?

Tinctura Cantharidis, 5 per cent. Dose ♏j–xx.

Ceratum Cantharidis, *Blistering Cerate*, (Cantharides 35, Yellow Wax and Resin āā 20, Lard 25 parts.)

Ceratum Extracti Cantharidis, (Cantharides 30, Resin 15, Yellow Wax 35, Lard 35 parts, Alcohol q. s.)

Charta Cantharidis, (Cantharides 1, Canada Turpentine 1, Olive Oil 1, Spermaceti 3, White Wax 8, Water 10 parts, spread on paper.)

Linimentum Cantharidis, (Cantharidis 15, Oil of Turpentine q. s. ad 100 parts.)

Emplastrum Picis cum Cantharidis, *Warming Plaster*, (Burgundy Pitch 92, Ceratum Cantharidis 8 parts.)

Collodium cum Cancharide, (Cantharides 60, Flexible Collodion 85, Commercial Chloroform q. s.)

Q.—What are the physiological actions of Cantharides?

Applied to the skin it is rubefacient and vesicant, acting more slowly than mustard, but much more severely. Internally it is a powerful irritant in large doses, in small doses diuretic and emmenagogue.

Q.—What are its therapeutic uses?

As a vesicant and counter-irritant in neuralgias, sciatica, neuritis, rheumatism, headaches, etc. Internally it is used in small doses in genito-urinary practice, in some skin affections, and externally for alopecia.

RHUS TOXICODENDRON. What is it?

The fresh leaves of *Rhus Toxicodendron*, the poison oak, and of *Rhus Radicans*, the poison ivy, shrubs of the Nat. Ord. Terebinthaceæ, indigenous to Canada and a greater portion of the United States.

Q.—What does it contain?

A volatile acid, *Toxicodendric acid*, tannin, etc.

Q.—What are its preparations?

There are no official preparations.

Tinctura Rhois Toxicodendri (unofficial), dose ♏ $\frac{1}{10}$-ij
Extractum Rhois Toxicodendri (has been used in France.)

Q.—What are its physiological actions?

Very irritating to the skin, much more marked in some individuals than others, producing great œdema and hyperæmia, with frequent vesicles or blebs and much itching, and considerable general disturbance.

Q.—What is its therapy?

Rarely used by regular practitioners, but it has been recommended in certain cutaneous affections, sprains, bruises, stings of insects, etc. Also internally in rheumatic pains and affections of fibrous tissues.

ACIDUM CHROMICUM. What is it?

Chromic Acid is obtained by the action of sulphuric acid upon potassium chromate.

Q.—What are its physical properties?

It occurs in the form of anhydrous, deep red, needle-shaped crystals, of an acid metallic taste, deliquescent and very soluble in water, with which it forms an orange yellow solution.

Q.—What are its physiological actions?

Not given internally. Externally applied it is a powerful escharotic, decomposing the tissues by its rapid oxidixing action. It acts slowly and gradually. but penetrates deeply. Caution is necessary in its use

Q.—What are its therapeutic uses?

In the form of paste, or solution more or less diluted, it is applied in lupus, morbid growths, and excrescences. Much used for removing warts, etc.

Q.—What strength of solutions is used?

For warts, syphilitic mucous patches, and enlarged tonsils it may be used as strong as gr. c-f℥j of distilled water. In gynæcological practice, and in mouth lesions a solution of about 1 in 40 marks an average.

Q.—What are its Dental uses?

As an obtundent to sensitive dentine, and as an escharotic in removing tumors and morbid growths from the gums, pulp, etc. In ulceration and recession of the gums. It has also been employed to destroy the pulps of temporary teeth.

Q.—How should this solution be applyed?

By means of a glass rod, or gold, or platinum wire, the surrounding parts carefully protected. Any excess being removed by an alkaline wash.

Q.—If a solution of Chromic Acid is made in glycerin, what precautions are necessary?

The glycerin should be added drop by drop to prevent explosion.

CAUTERY.

Q.—What is meant by the term "Cautery"?

The application of a caustic substance, or of a hot iron; also, the hot iron or substance thus applied.

Q.—How are Cauteries divided?

Into Actual and Potential.

Q.—What is Actual Cautery?

Fire itself, and heated metals.

Q.—What is meant by the term "Moxa"?

The slow burning of small masses of combustible matter (such as cotton wood) in contact with the skin.

Q.—What is Potential Cautery?

The application of Caustic substances, as potassa, lunar caustic, etc.

Q.—For what purpose is the Actual Cautery usually used?

As a styptic.

Q.—What is meant by Galvano-Cautery?

The application of heat to a wire loop or other suitable substance by the galvanic current.

Q.—What are its advantages?

Easy application to inacessible parts, absence of hemorrhage and comparatively little pain.

Q.—For what purposes are the Potential Cauterants usually used?

1st. To effect the destruction of morbid growths; 2d, to destroy the virus of rabid and venomous animals, chancres and malignant pustules and to prevent their absorption; 3d, for the cure of violent inflammation; 4th to stimulate indolent sinuses, ulcers, etc.; 5th, to form issues; 6th, to remove morbid heterologous growths.

COLLODIUM.

Q.—What is Collodium?

A solution of pyroxylin (4 per cent.), in stronger ether (70 per cent.), and stronger alcohol (26 per cent.)

Q.—How is pyroxylin prepared?

By the action of nitric and sulphuric acids on gun cotton.

Q.—What are its physiological properties?

A slightly opalescent, syrupy liquid, with a strong ethereal odor. By long standing it deposits a layer of fibrous matter, and becomes more transparent; this layer should be reincorporated before using.

Q.—How many Collodions are official?

Four, viz:

Collodium.
Collodium cum Cantharide,
Collodium Flexile,
Collodium Stypticum.

Q.—What is blistering Collodium?

Collodium with Cantharides is composed of Cantharides 60 parts exhausted by chloroform and evaporated to 15 parts to which is then added Flexible Collodion 85 parts.

Q.—What is Flexible Collodion?

Collodion, 92 parts, Canada turpentine 5 parts, castor oil 3 parts.

Q.—What is Styptic Collodion?

Tannin 20 parts, dissolved in alcohol; 5 parts stronger ether 20 parts; Collodion 55 parts.

Q.—How does Collodion act?

When applied to the skin, the solvent evaporates and it forms a colorless, transparent, flexible and strongly contractile film. In this way it proves antiphlogistic by driving the blood from a part, limiting effusion and promoting absorption and at the same time acts as an emollient by protecting an inflamed surface from the action of the air.

Q.—How are Collodions applied?

In the form of a paint by means of a brush, making repeated coatings.

Q.—What is an objection to its use?

Its tendency to contract.

Q.—How may this be obviated?

By adding a few drops of castor oil to each ounce.

Q.—What are its therapeutic uses?

To cover excoriated surfaces and to seal small wounds.

Q.—What are the Dental uses of Collodion?

To prevent alveolar abscesses from discharging on the face; in combination with carbolic acid in odontalgia, and as a styptic. In the laboratory it is used as a coating for plaster casts. The Cantharidal Collodion as a counter-irritant in periosteal or pericemental inflammations.

GLYCERINUM.

Q.—What is Glycerinum?

A clear, syrupy, sweet liquid, obtained by the decomposition of fats, through the agency of steam.

Q.—What are its physical properties?

Pure glycerin is a trihydric alcohol, clean, oily to the touch, without odor, neutral in reaction, and hydroscopic.

Q.—In what is it soluble?

In all proportions in water or alcohol, but insoluble in ether, chloroform, benzole, or the fixed oils.

Q.—What effect has nitric acid upon Glycerin?

It forms nitro-glycerin, or glonoin, a substance with powerful explosive properties.

Q.—What are its physiological properties?

Being hygroscopic, it abstracts water from the tissues with which it comes in contact. Internally it has no effect beyond a mild laxative influence. It is nutritious, emollient, and prevents the disagreeable odor of discharges. It does not evaporate at an ordinary temperature.

Q.—What are its principal uses?

As a vehicle in prescriptions, as a solvent, as an emollient, as an enema, and to sweeten the beverages of persons suffering from diabetes, who cannot take sugar.

Q.—What is the dose of Glycerin?

From ʒj-iv.

Q.—In what class of preparations does it enter?

The Glycerites.

Q.—What Glycerites are official?

Glyceritum Amyli.
Glyceritum Vitelli.
Unofficial—
Glyceritum Acidi Tannici.
Glyceritum Pepsini.
Glyceritum Pepsini Vitulini.
Boro-Glyceridum.
Nitro-Glycerinum.

Glycerin also enters into several extracts, fluid extracts, pill masses, mucilage of tragacanth, solution of pepsin and other pharmaceutical preparations.

Q.—What are its Dental uses?

Principally as a solvent and emollient, as a solvent when used alone, and as both solvent and emollient when combined with other substances.

Q.—In what diseases of the oral cavity is it beneficial?

The different forms of stomatitis, ulceration, apthæ, abscesses and abrasion.

Q.—How is it usually administered?

In combination with other agents, such as borax, carbolic acid, iodine, sulphite soda, etc., and as an anodyne and emollient in combination with morphine, atropine, acetate of lead, etc.

Give formulae containing Glycerin.

For Chronic Abscess, Ulceration, etc.

℞	Glycerini,	℥j
	Tinct. Iodi comp.,	♏xlv
	Acidi Carbolici [Cryst]	♏vi
	Aquæ dest.,	℥v

M. Signa: Apply as a lotion or injection.

[GORGAS.]

NOTE.—Almost the same as the above is expressed in the following:

℞ Syrupus Iodo-Phenique [Declat], ℥vj
Signa: Teaspoonful a dose.

The latter mostly used as an internal remedy to prevent fermentation and promote intestinal antisepsis.

For Apthous Ulceration.

℞	Glycerini,	℥j
	Sodii boratis,	ʒij
M.	Signa: Apply as a lotion.	[GORGAS.]

For Pulp Canals of Abscessed Teeth.

℞	Glycerini,	fʒij
	Acidi Tannici,	ʒj
	Morph. Acetatis.,	ʒij
	Iodoformi,	ʒj
M.	Signa: Apply on floss silk or cotton.	[FAUGHT.]

ADEPS. What is it?

Lard, or the prepared Internal fat of the abdomen of *sus scrofa* (the hog), purified by washing, melting and straining.

Q.—What are its physical properties?

Below the temperature of 90° it occurs as a soft, white solid, which for medicinal uses should be free from saline matter.

Q.—In what is it soluble?

Entirely soluble in ether, benzin, and bisulphide of carbon.

Q.—Of what is it composed?

Of 62 per cent. of olein, or fluid fat, and 38 per cent. stearin and margarin.

Q.—For what is it principally used?

Largely used in pharmacy as a basis for ointments and cerates, and in domestic practice as a lubricant.

Q.—What is an objection to its use?

Its tendency to become rancid,

Q.—How is this overcome?

By the addition of benzoin, or digesting it with beta-naphthol, or poplar buds.

Q.—What preparations are official?

Adeps Benzoinatus, Benzoin 2 per cent.,
Oleum Adipis, *Lard Oil*,

[*Unofficial.*]

Adeps Dehydratus, purified and dehydrated for ointments.

LINUM—Flaxseed. Linseed.

Q.—What is Flaxseed?

The seed of Linum usitatissimum flax (Nat. Ord. Linaceæ), a cultivated annual plant.

Q.—What do these seeds contain?

Mucilage and *Linolein,* a fixed oil.

Q.—What preparations are official?

Only the seed (Flaxseed) and the oil (Linseed oil); an infusion is used, though unofficial; and Carron oil, unofficial, is made by emulsifying equal parts of Linseed oil and lime-water.

Q,—What are its physiological actions?

Flaxseed is demulcent, emollient, expectorant and diuretic.

Q.—What are its therapeutic uses?

The ground seed is often used as a poultice, either alone or combined with opium and lead water. The infusion contains the mucilaginous principles and a small portion of the oil, and is advantageously used in inflammation of the mucous membranes of the throat, the gastro-intestinal tract and the urinary passage; as a demulcent in coughs, etc.; the oil as a laxative and as an application to burns.

CETACEUM.—Spermaceti.

Q.—What is Spermaceti?

A peculiar concrete fatty substance obtained from the Sperm-whale.

Q.—What are its physical properties?

It is a fatty substance with little taste or odor; can be reduced to a powder by the addition of a little alcohol.

Q.—How does it differ from other fats?

It does not yield glycerin when saponified, but *Ethal;* it is not acted upon by a boiling dilute solution of soda, and leaves no grease spot on paper.

Q.—For what is it used?

Almost exclusively as an ingredient in ointments.

Q.—What preparations are official.

Ceratum Cetacei, 10 per cent.

Unguentum Aquæ Rosæ. (Expressed oil of almonds 50, rose water 30, spermaceti and white wax, of each, 10 parts), sometimes called cold cream, and is used for excoriated surfaces and chapped hands and lips.

PETROLATUM.—Petroleum Ointment.

Q.—What is Petrolatum?

A semi-solid substance consisting of hydrocarbons, chiefly of the marsh-gas series ($C_{16}H_{34}$, etc.) obtained from American petroleum by distilling off the lighter portions and purifying the residue.

Q.—By what other names is Petrolatum prescribed?

Cosmoline, Vaseline, Petrolina and Deodorolina, etc.

Q.—What are its physical properties?

It is an amorphous, pale-yellowish, odorless, tasteless, or nearly so, transparent fatty substance, in thin layers, more or less fluorescent. It can also be obtained as a liquid oil.

Q.—What other substances are obtained from Petroleum?

Benzin, rhigolene, coal oil and paraffin.

Q.—What is Benzin?

Benzin consists of the more volatile portions, being very inflammable, and yields vapors, which, if combined with air, are explosive.

Q.—What is coal oil?

Coal oil, for illuminating purposes, consists of less volatile hydrocarbons, which should not evolve explosive vapors under 110°F.

Q.—What is Rhigolene?

Rhigolene is one of the lightest products of the distillation of petroleum. is extremely volatile, boiling at about 64½°F.

So great is the rapidity of its evaporation that local temperature is depressed to 15° F. by a spray of Rhigolene.

Q.—What is Paraffin?

A white, waxy, inodorous, tasteless substance, obtained by distilling the residuum obtained from the refiners of petroleum and collecting and purifying the distillate. It is harder than tallow and softer than wax.

Q.—What are the physiological actions and uses of Petroleum?

Petroleum is a valuable protective dressing, possessing some antiseptic power, and slightly stimulant. It has no activity and is not liable to become rancid. It is readily miscible with many active agents, as the alkaloids, phenol compounds, etc., but does not penetrate the skin as readily as animal fats and fixed oils; used as an application to wounds, cuts, skin diseases, etc,

Q.—What are the Dental uses of Petroleum?

In Dental practice, it has been used in excoriated and inflamed surfaces of the oral cavity and as a dressing for root canals. Carbonated Petrolatum has also been used as a filling for canals in conjunction with cotton, but the results are questionable.

AMYLUM—Starch.

Q.—What is Starch?

$C_6H_{10}O_5$, is the fecula of the seed of *Triticum vulgare*, common wheat (Nat. Ord. Graminaceæ). It is also a constituent of other grains and plants,

Q.—What preparations are official?

Amylum Iodatum, *Iodized Starch*
(Starch 95, Iodine 5 parts), dose ʒi–℥ss

GLYCERITUM AMYLI—Glycerite of Starch.

(Starch 10, Glycerin 90 parts) used as a vehicle for external application.

Q.—What are the preparations and uses of Starch?

Starch is a nutritive of the first order, but practically inert medicinally. It serves as a protective and absorbent if dusted over the skin, as a vehicle for enemata, and as an antidote in iodine poisoning. Mixed with glue it makes a stiff bandage for surgical purposes.

OLEUM THEOBROMA—Cacao Butter.

Q.—What is Cacao-Butter?

A fixed oil expressed from the seed of *Theobroma Cacao*, the Chocolate tree (Nat. Ord. Sterculiaceæ), growing in Mexico, West Indies and South America.

Q.—Of what does it consist?

Chiefly of stearin, with a little olein,

Q.—What is its chief use?

As a basis for suppositories.

GLYCYRRHIZA—Liuqorice Root.

Q.—What is Liquorice?

The root of *Glycyrrhiza glabra* (Nat. Ord. Leguminosæ), a native in South Europe and Asia, but cultivated in other parts,

Q.—What are its physical properties?

It occurs in long pieces 1-5 to 1 inch in thickness, with longitudinal wrinkles, of a grayish brown color externally, tawny yellow internally, pliable and tough with a somewhat acrid, sweet taste.

Q.—What does it contain?

A yellow amorphous glucoside, *glycyrrhizin;* also glycyrrhizinc acid, *asparagin*, sugar, resin, gum, etc.

Q.—What are its preparations?

Extractum Glycyrrhizæ,

Extractum Glycyrrhizæ Purum,

Extractum Glycyrrhizæ Fluidum, dose indefinite.

Mistura Glycyrrhizæ Compositi. *Brown mixture:* (Pure extract 3; paregoric 12; antimonial wine 6; spirits of nitrous ether 3; sugar 3; water 70 parts.) Dose fʒss.

Pulvis Glycyrrhizæ et Opii. *Winter's Congh Lozenges:* (Extract Liquorice gr ij; ext. opii gr. 1-20 in each, with oil anise, sugar and acacia.) Dose i-ij.

Pulvis Glycyrrhizæ Compositus. *Compound Liquorice Powder:* (Senna 18; liquorice root powd. 16; fennel 8; washed sulphur 8; sugar 50 parts.) Dose fʒi-ij.

Glycyrrhizinum Ammoniatum; (for flavoring.)

Infusum Lini Compositum. Contains flaxseed ℥ss, liq. root contused, ʒij in a pint. Dose ad. lib.

Q.—What is the physiological action of Liquorice?

Demulcent and slightly stimulating to the bronchial membrane, and laxative.

Q.—What are its therapeutic uses?

Useful in throat and bronchial troubles as a demulcent and expectorant, and as a laxative, especially during pregnancy.

PYRETHRUM.—Pellitory.

Q.—What is Pyrethrum?

The root of *Anacyclus pyrethrum*. (Nat. Ord. Rosaceæ), a small African plant cultivated in Europe.

Q.—What does it contain?

An alkaloid *Pyrethrine*, an acrid resin, a volatile oil, tannic acid, starch, mucilage, etc.

Q.—What are its physiological actions?

Of an acrid taste, it causes a free flow of saliva with a prickly, pungent effect upon the tongue when chewed. If swallowed in large doses, it causes diarrhea, tenesmus and dysentery, with depression and stupor.

Q.—What is its Therapy?

In neuralgic, rheumatic and other painful affections of the tongue and teeth, it is chewed and held in the mouth? In scorbutus and sore throat where the mucous membrane is relaxed the tincture, diluted with water is used as a mouth wash.

Q.—What preparation is official?

Tinctura Pyrethri, 20 per cent. Not used internally.

ICHTHYOCOLLA—Isinglass—Fish Glue.

What is Isinglass?

The inner membrane of the swimming bladder of *Acipenser huso* and of other species of Acipenser (class pisces, order sturiones), which is generally spread out in drying, forming flat sheets, or leaf-isinglass.

Q.—What kind is the most valued?

That imported from Russia.

Q.—What is it chemically?

A pure gelatine, known to chemists as glutin.

Q.—In what is it soluble?

In boiling water and boiling dilute alcohol.

Q.—For what purposes is it used?

For clearifying infusions, and boiled with milk it is given internally in bowel disorders. The well-known court-plaster is isinglass spread on silk and used for approximating small wounds and excluding the air.

TRAGACANTHA—Tragacanth.

Q.—What is Tragacanth?

The product of trees growing in Asia Minor and Persia. A gummy exudation from *Astragalus gumimfer* and other species of Astragalus.

Q.—What are its physical properties?

It occurs in white flattened bands, horn-like or translucent, and when moistened with water is converted into a gelatinous mass.

Q.—Of what does it consist?

Of *Arabin*, *Bassorin*, and a little starch.

Q.—For what purposes is it used?

To paste labels on bottles and boxes, as the basis of most troches, and in preparing emulsions. In medicine it is sometimes used as a demulcent in pharyngitis, gastritis, and inflammation of the bowels.

Q.—What are its Dental uses?

As a paste, and in a perfumed powder to assist in in retaining artificial dentures until suction can be established.

CALENDULA—Marigold.

Q.—What is Calendula?

The fresh flowering herb of *Calendula officinalis*

(Nat. Ord. Compositæ) a well known garden plant.

Q.—What does it contain?

A volatile oil, an amorphous bitter principle, *Calendulin*, yellow coloring matter, etc.

Q.—What are its physiological actions?

Stimulant, diaphoretic, antispasmodic, sudorific and emmenagogue, though seldom used internally.

Q.—What are its therapeutic uses?

Locally as a revulsive in sprains, bruises, or in superficial burns or scalds, resembling arnica in its application, though less active.

Q.—What are its Dental uses?

As an application to wounds in the mouth, after extraction, and in partially exposed pulps, also in superficial inflammation of the gums and mucous membranes of the mouth.

Q.—What preparation is official?

Tinctura Calendulæ (20 per cent.)	dose fʒss–j

SANDARACA—Sandarach.

Q.—What is Sandarach?

A resinous substance obtained from an evergreen tree, *Thuja Articulata*, which grows in the Northern part of Africa.

Q.—What are the physical properties of the gum?

It is in the form of small, irregular round and oblong tears, a pale yellow color, sometimes brown, and more or less transparent, dry and brittle. It melts with heat, diffusing a strong balsam odor, and is inflammable.

Q.—In what is it soluble?

In alcohol and ether, slowly dissolving in warm oil of turpentine.

Q.—What are its uses?

Sandarach was formerly employed as a medicinal agent, and entered into the composition of various ointments and plasters, but its use is now restricted to such purposes as the composition of varnish, as an ingredient of incense, etc.

Q.—What are its Dental uses?

Dissolved in alcohol it forms a varnish for coating the surface of plaster models, etc.; it is also used for checking secretions from the gums during the operation of filling teeth, either applied to the cavity, the surface, or on bibulous paper saturated with it. Also employed on cotton for a temporary stopping to protect medicinal applications.

Give formulæ for a varnish.

℞	Gum Sandarach,	℥v
	Alcohol,	qt. j

Mix and digest over a moderate heat until the sandarach is dissolved.

SHELL-LAC—Shellac.

Q.—What is Lac?

A resinous substance obtained from several varieties of trees which grow in the East Indies, and particularly from the *Croton Lacciferum*, and two species of *Ficus*.

Q.—How is Shell Lac prepared?

It is prepared from the crude Lac by melting, straining, and pouring on a flat, smooth surface.

Q.—In what is it soluble?

Insoluble in water, but freely soluble in alcohol; more so in warm alcohol. Shellac may be dissolved without the aid of alcohol by a saturated solution of borax in water.

Q.—What are its uses?

Slightly astringent, it has been recommended as an adhesive dressing for ulcers, wounds, etc.; also used as a varnish.

Q.—What are its Dental uses?

The same as Sandarach, but its color renders it objectionable in some places.

COPAL.

Q.—What is Copal?

A resin produced by a plant, *Rhus copallinum*, which grows in Mexico.

Q.—In what is it soluble?

Slightly soluble in alcohol and essential oils.

Q.—What are its uses?

Used as a varnish.

SILEX.

Q.—What is Silex?

A word used to designate any flinty substance; also as an equivalent of Silica.

Q.—What is Silica?

Silica (Silicic, anhydride) occurs in nature as sand, flint-rock crystals, quartz, etc.

Q.—How is it prepared?

By heating silicic acid to 100°.

Q.—In what is it soluble?

Insoluble in water and acids, with the exception of hydrofluoric acid.

Q.—What are its Dental uses?

Used in the preparation of artificial teeth, and in the form of *Liquid Silex* as a varnish for plaster casts.

SOAP-STONE.

Q.—What is Soap-stone?

One of the varieties of Talc. Saponite or Steatite. An amphorous mineral occuring as nodules, or filling crevices, and forming amygdules in igneous rocks.

Q.—What are its physical properties?

Soft, but brittle when dry; dull or greasy lustre, and of various colors.

Q.—What is its composition?

Essentially a hydrated silicate of magnesia and alumina, but analyses vary considerably.

Q.—How is it sometimes defined?

As a clay resembling soap, occuring in the granite of the hot springs of Plombieres, France.

Q.—What are its uses?

Chiefly as a powder for excoriated or chafed surfaces, and in the arts to prevent substances from sticking together.

ISONANDRA-GUTTA—Gutta-Percha.

Q.—What is Gutta Percha?

The inspissated juice of the tree *Insonandra Gutta*, found in the East Indies.

Q.—What are its physical properties?

It is in the form of tough, flexible pieces, which have been freed from impurities by cutting it into thin slices, and then washing and tearing it into shreds.

Q.—How may it be further purified?

By dissolving it in either chloroform, benzol or hot turpentine, thus causing the impurities to separate, when it is evaporated to dryness.

Q.—In what is it soluble?

Gutta Percha is dissolved cold by chloroform and sulphide of carbon; benzol requires the aid of heat, and oil of turpentine requires to be quite hot. The alkalies have no action upon it, but concentrated nitric acid attacks it rapidly, with effervesence and the escape of nitrous fumes.

Q.—Whatare its Dental uses?

Combined with mineral substances it forms a plastic material for temporary fillings of teeth, and colored with vermilion is used for taking impressions and for base plates; also for interdental splints, and to secure crowns upon roots of teeth, and in cones as a root filling.

Q.—What is Liquor Gutta Percha?

A solution of Gutta Percha in chloroform, Gutta Percha ℥iss; Chloroform ℥xvij.

Q.—For what is it used?

As a surgical dressing; and in dentistry, to protect exposed pulps, and to fill root canals.

LACMUS—Litmus.

Q.—What is Litmus?

A peculiar coloring matter obtained from various species of *rocella* (Nat. Ord. Lichenes), which grow on Alpine or Maritime rocks in various parts of the world.

Q.—From whence are the varieties obtained that are used for chemical purposes?

From the European and African coasts, but it is prepared chiefly in Holland.

Q.—What is its principal use?

In chemistry, to denote the acidity or alkalinity of a solution. The blue Litmus paper is changed to red by an acid, and the red again becomes blue on being mixed with an alkali.

NOTE. A single color, viz.: purple, has recently been substituted for the ordinary blue and red paper, turning red with acids and blue with alkalies.

CHARCOAL.

Q.—What two varieties of Charcoal are used in medicine?

Carbo animalis purificatus, purified animal charcoal or "bone-black" and *Carbo ligni*, wood charcoal.

Q—How is Animal Charcoal obtained?

By exposing bones to a red heat, protected from the air.

Q.—How is it purified?

By digesting bone-black in hydrochloric acid and water to a moderate heat, when it is dried and heated to redness in a covered crucible.

Q.—What are its properties and actions?

It is absorbent, and is used to counteract the effects of poisonous agents, such as the alkaloids and acids.

Q.—What is the dose of Animal Charcoal?

From gr. x–ʒj.

Q.—What are the properties of Wood Charcoal?

Antiseptic and disinfectant detergent. It corrects the fetor of discharges, and arrests the process of ulceration.

Q.—What are its therapeutic uses?

For foul and gangrenous ulcers, gangrene, phagadæna, suppurating surfaces, cancerous tumors, etc.

Q.—What are its Dental uses?

As an efficient disinfectant gargle for offensive fetor of mercurial stomatitis, foul and gangrenous ulcers of the mouth, diseased gums, etc.

Q.—Is it recommended as a dentrifrice?

Q.—No. It is insoluble in the fluids of the mouth, has a tendency to collect under the free margins of the gums, and thus proves irritant and promotes recession.

IRIS FLORENTINA—Orris Root.

Q.—What is Orris Root?

Several species of the genus Iris (Nat. Ord. Iridaceac) furnish the rhizome known by the name of Orris-root.

Q.—What does it contain?

A volatile oil, an acrid resin, starch, mucilage, etc.

Q.—What are its therapeutic properties?

Alterative, cathartic, and diuretic, though seldom employed internally.

Q.—What are its uses?

Principally in making sachets, tooth powders, and alcoholic tinctures, in perfumery and flavoring extracts.

QUILLAIA—Soap Bark.

Q.—What is Soap Bark?

The bark of the *Quillaia Saponaria* (Nat. Ord. Rosaceae), a native tree of Chili; the inner bark being employed.

Q.—Upon what does its saponaceous properties depend?

Upon the presence of a poisonous glucoside *Saponin.*

Q.—What are its therapeutic uses?

Quillaia bark is used as a febrifuge, to arrest excessive secretions, as an application to ulcers, as a remedy for colds in the head, etc.

Q.—What are its Dental uses?

In the form of powder, tincture and fluid extracts, it is employed as an ingredient of mouth washes for its frothy and detergent properties; as an application to chronic ulcers of the mouth, and to arrest excessive secretions of the mucous membrane.

APPENDIX.

NEW REMEDIES.

The following have been introduced and are deserving of mention with their action and posology:

ANTIKAMNIA. What is it?

A substance recently introduced by an American firm, and by analysis determined to be a mixture of sodium bicarbonate, acetanlid and caffein [Goldman and Hoffman] in the proportion of about 20, 70 and 10 respectively?

Q.—What are its physical properties?

A fine powder.

Q.—What are its physiological actions?

Antipyretic, analgesic and anodyne.

Q.—What is its dose?

From grs. iij to x, every three or four hours. Better results are obtained by administering gr. v. every five minutes until four doses are taken, as an analgesic.

BROMOL. What is it?

Tribromophenol recently introduced as an antiseptic and recommended to be used in solution [1:30 olive oil] or ointment [1:10]; as powder or dressing in doses of $\frac{1}{10}$ to ⅓ grain it has been administered in cholera infantum and typhus abdominalis.

BROMOFORM. What is it?

An analogue of chloroform discovered in 1832 by Lowig.

Q.—How is it prepared?

By the action of bromine upon a solution of equal parts of caustic potassa and methyl alcohol.

Q.—What should be its appearance for medicinal use?

It should be free from acid and color. It should be kept from the sunlight.

Q.—What are its medicinal uses?

Principally as a remedy in pertussis, in daily doses of 5, 10, 15 to 20 drops dissolved in 4 ounces of water with addition of spirits.

CHLORAL-PHENOL. What is it?

A combination of chloral and carbolic acid.

Q.—What are its physical properties?

A colorless, clear liquid, possessing the odor and taste of its constituents.

Q.—What are its physiological actions?

Applied to the skin it produces inflammation and an eruption of small blisters; applied to an aching tooth it is anodyne.

CHLORALAMIDE. What is it?

Chloralamide is the result of the interaction of chloral [not chloral hydrate] and formamide.

Q.—What are its physical properties?

Lustrous, colorless crystals with a somewhat bitter taste. Slowly soluble in 10 parts of cold water or 1½ parts of alcohol.

Q.—What effect has heat upon the solution?

It decomposes the chloralamide into chloral hydrate and ammonium formate. The same effect is produced by the action of alkalies, but not by dilute acids.

Q.—What is its therapy?

The same as Chloral.

Q.—What are its advantages?

It is claimed that it does not effect respiration or pulse, the blood pressure or the digestion.

Q.—What is its dose?

From grs. 30 to 45.

CREOLIN. What is it?

A product of coal-tar; a dark brown alkaline liquid, containing in solution the higher homologues of phenol.

Q.—What are its physical preperties?

When pure, it is inoffensive to man or animals; insoluble in water, but soluble in ether, chloroform, and absolute alcohol.

Q.—What are its physiological actions?

Antiseptic, germicide, and hæmostatic. It is claimed that its germicidal powers are ten times greater than those of carbolic acid, and its action on the spores more pronounced than mercuric chloride.

Q—What is its therapy?

It is used in solution (2 per cent.), in ointment, as a dusting powder (10 per cent.), on gauze (10 per cent.) and surgical soap (10 per cent.) Internally it is given in capsules ♏ 5 each.

CAMPHORIC ACID. What is it?

The product of the oxidation of camphor with nitric acid.

Q.—What are its physical properties?

When purified it forms white acicular or scaly crystals, odorless, and with a feebly acid taste. Difficultly soluble in cold water, more so in hot water, alcohol and ether and fatty oils.

Q.—For what is it used?

In acute and chronic diseases of the respiratory tract ½ to 6 per cent., and in spasmodic affections. Dose, one to four grains.

DICHLORIDE OF ETHIDENE. What is it?

A substance very much like chloroform, obtained in the preparation of chloral from the waste products.

Q.—What are its uses?

As a general anæsthetic, occupying an intermediate rank between chloroform and ether. It has also been employed as a local anæsthetic in the same manner as chloroform, aconite, etc., for the relief of neuralgia.

EUPHORINE. Phenyl-urethane. What is it?

A crystalline compound obtained by the interaction of aniline and chlorocarbonic ethyl ether.

Q.—What are its uses?

As an antipyretic and antirheumatic and antineuralgic. Dose, grs. iij to viij.

EUROPHEN. What is it?

The result of tne action of iodine upon isobutylorthocresol in alkaline solution.

Q.—What are its physical properties?

An amorphous yellow powder, with an aromatic odor.

Q.—What percentage of iodine does it contain?

About 28 per cent.

Q.—In what is it soluble?

Insoluble in water or glycerin; soluble in alcohol ether, chloroform and oils.

Q.—What are its uses?

As a substitute for Iodoform. It is claimed to be non-toxic and with a more pleasant odor.

GLEDITSCHINE. Stenocarpine. What is it?

An alkaloid obtained from the tree *Gleditschia Triacanthus.*

Q.—For what purpose has it been used?

As a local anæsthetic. Its physiological action appears to be similar to that of cocaine.

EXALGIN. What is it?

A crystalline compound allied to Acetanilid?

Q.—How is it prepared?

By warming together monomethylaniline and acetyl chloride.

Q.—What is its therapy?

Chiefly as an analgesic. Dose from ½ to 4 grains.

IODINE TRI-CHLORIDE. What is it?

Tri-chloride of Iodine is obtained by the action of Chlorine on Iodine.

Q.—What are its medicinal properties?

Antiseptic and disinfectant, usually used in a dilution of 1-1,200. According to Dr. Miller a five per cent. solution is one of the most active agents for sterilizing carious cavities, and disinfecting carious dentine.

IODOPHENACETIN. What is it?

It is obtained when a cold saturated solution of phenacetin, acidulated with hydrochloric acid, is treated with Iodine.

Q.—For what purpose is it used?

As an antiseptic and germicide.

HYPNONE. What is it?

When pure, a colorless oily liquid with a peculiar odor and pungent taste, obtained by the dry distillation of calcium acetate and calcium benzoate.

Q.—What are its uses?

As a hypnotic: Dose 3 to 8 grains.

KANDOL. What is it?

A product of the distillation of naptha; a clear, colorless fluid, extremely volatile.

Q.—What are its uses?

As a local anæsthetic.

LYSOL. What is it?

A new tar combination obtained by boiling tar oils with alkalies and fats. It is of the consistency of soft soap, contains no phenol, but principally cresol, and is soluble in water.

Q.—What are its uses?

It is claimed that Lysol is superior as a germicide to mercuric chloride, carbolic acid, iodoform, or creolin; usually used in 1 per cent. solution.

PYOKTANIN. What is it?

A descriptive name applied to methyl-violet, an alkaline dye. It was brought to notice by Prof. Stilling, who stated his belief that it was able to penetrate tissues and destroy deeply-imbedded micro-organism. It has been used with varying success as an antiseptic, its chief value seeming to be as a parenchymatous injection in inoperable neoplasms. Usual solution from 1-100 to 1-2,000.

MICROCIDIN. What is it?

A combination of napthol and soda; napthol 25, sodium naptholate 75; soluble in three parts of water.

Q.—What are its uses?

Antiseptic and disinfectant, used in solution of from 3 or 5 to 1000.

METHYL CHLORIDE. What is it?

CH_3, Cl. Chlormethane. A gaseous compound prepared by the interaction of molecular proportions of methyl alcohol and hydrochloric acid, with or without the addition of chloride of zinc.

Q.—In what is it soluble?

In ½ its volume of water, much more so in ethyl or methyl alcohol, and freely in ether and chloform.

Q.—How is it liquified?

By a pressure of 5 atmospheres at normal temperature, or under normal pressure at 25° C.

Q.—What is its use?

As a local anaesthetic.

METHYLENE CHLORIDE. What is it?

CH_2, Cl_2. Dichlormethane, is the result of the action of chlorine on marsh gas. Also prepared by the reduction of chloroform (in alcoholic solution) by zinc and HCl, the product being mixed with water,, the specifically heavier liquid separated and purified by successive treatments with soda solutions, sulphuric acid, water, chloride of calcium and fractional distillation.

Q.—What are its physical actions?

A colorless liquid resembling chloroform in odor and solubility.

Q.—For what purpose has it been used?

As a substitute for chloroform, with the belief that as it contained less chlorine it would be safer.

PENTAL. What is it?

$(CH_3)_2C. CH. CH_3$. Tri-methyl-ethylene, is a tertiary amylene obtained by heating amylene hydrate in the presence of acids; boiling point 38° C.

Q.—What are its physical properties?

A colorless liquid with a low sp. gr.; burns with a bright flame and can be inhaled without injury to the membranes of the mouth and air passages. Insoluble in water, but mixes readily in any proportion with alcohol, chloroform and ether. It is inflammable and exceedingly volatile, but does not decompose on exposure to the air and sunlight.

Q.—For what purpose is it used?

As a general anæsthetic.

Q.—What advantages are claimed for it?

That it is free from any of the halogens; rapidity of action, safety and a more prolonged action than nitrous oxide.

PHENOCOLL HYDROCHLORIDE. What is it?

A new antipyretic prepared by the interaction of phenetidin and glycocoll or amido-acetic acid.

Q.—What are its physical properties?

Q.—For what purpose has it been used?

As an antipyretic, a nervine and anti-neuralgic.

Q.—How is it administered?

Preferably in powder, 1¼ drachms divided over 24 hours.

SULPHONAL. What is it?

A synthetical hypnotic.

Q.—What are its physical properties?

Colorless, inodorous, practically tasteless, prismatic crystals.

Q.—In what is it soluble?

In 15 parts of boiling water and in about 450 parts of cold water; in cold rectified spirits, and freely in boiling alcohol.

Q.—What is its dose?

From 15 to 45 grains.

Q.—For what is it principally used?

In nervous insomnia.

Q.—How is it best administered?

In powder or wafers, one or two hours before retiring.

SODIUM DITHIOSALICYLATE. What is it?

Described as Nos. I and II; contains two molecules of salicylic acid bound to two molecules of sulphur. For No. II is claimed powerful antirheumatic properties; and for No. I, powerful antiseptic properties. For No. I it is claimed that the most resistent bacilli are destroyed in from 2 to 15 minutes by a 15 per cent. solution, and that a very severe case of ozæna was completely cured in a relatively short time.

TERCHLORIDE OF PHENOL. What is it?

The result of the action of chlorine gas on chemically pure carbolic acid.

Q.—What are its uses?

A valuable antiseptic and disinfectant; has been recommended in dental practice in combination with iodoform as a capping and dressing for pulps, and as a filling for root canals.

URETHANE. What is it?

The result of the interaction of nitrate of urea and ethyl alcohol at 120° to 130° C., extraction of the resultant urethane by ether, and recrystallization.

Q.—What are its physical properties?

Colorless, columnar or tabular crystals, odorless, with a nitre-like taste.

Q.—In what is it soluble?

Readily soluble in water and most media.

Q.—What are its physiological actions?

A hypnotic. Dose 15 to 30 grains.

TEST PAPERS FOR DENTISTS.

Very frequently it is important to the dentist to know whether his peroxide of hydrogen, which is so liable to change, is still good or has become decomposed; or whether his solution of bichloride of mercury has become inert by the reducing action of organic matter in the water under the influence of sunlight. And so of many other chemicals used in the dental office which are apt to change in strength.

Prof. Chas. Mayr, of Springfield, Mass., has prepared a series of test papers which will enable the dentist to learn quickly and accurately whether his preparations are good or worthless, and without the use of cumbersome methods. They are put up in neat little books, each containing eight different papers, (of some, like litmus, several papers are provided), affording sixty-four different reactions. The papers are as follows:

Phenyl-Carbinol, for strong acids and alkalies.
Turmeric, for alkalies.
Sulphide, for solution of metals.
Potassium Iodide, for H_2, O_2, bichloride 1-500.
Iodide Starch, for hydrogen peroxide.
Litmus, for weak acids and alkalies.
Erythroine, for salts and alkalies.
Lacmoid, (substitute for litmus,) not affected by carbonic acid

Each paper has printed upon it the reactions it gives, so that even the inexperienced have a safe guide as to its uses. (GORGAS.)

GRADUATED TABLE FOR ADMINISTERING LAUDANUM.

For a child at birth, or one month old,	½ to 1 drop.
Under a year old,	½ to 3 drops.
From one to two years,	1 to 5 drops.
From two to five years,	2 to 8 drops.
From five to ten years,	5 to 15 drops.
From ten to fifteen years,	10 to 20 drops.
At fifteen,	15 to 20 drops.
For an adult,	25 to 30 drops.

It is important, in the employment of laudanum, that it should be of the proper strength and perfectly clear. Thirteen minims represent one grain of opium. Laudanum becomes stronger with age, especially if the bottle be not tightly corked.

TABLE OF DROPS IN FLUIDRACHM.

DROPS.

The size of drops varies very much, not only in different liquids, but also in the same liquid, according as it comes from different bottles. A bottle with a large thick lip gives a larger drop than one with a small thin lip, especially if the liquid be allowed to diffuse itself over the lip. "Droppers," as usually made, give a drop much smaller than that from a bottle, the size of the drop being absolutely dependent upon the size and bore of the point of the dropper. A dropper with a large thick point may give a very large drop. The average drop of watery solutions, waters or liquids, is about 60 to the fluid-drachm; ot syrups, except some which are very thick, about 60 to the fluid-drachm; of volatile oils, 110 to 120; of wines, 75; of vinegars, 75; of ether, 150; of chloroform, 200. Deodorized laudanum (tinctura opii deodorata) is really a watery preparation; hence, whilst laudanum averages 120 drops, it averages 100 to the fluid-drachm.

PERIODS OF ERUPTION OF THE TEETH.

FIRST DENTITION.

As a rule, the teeth of the lower jaw precede those of the upper, except in the case of the lateral incisors.

Central incisors,	5th to 8th month.
Lateral incisors,	7th to 9th month.
First molars,	12th to 16th month.
Canines,	16th to 20th month.
Second molars,	20th to 36th month.

SECOND DENTITION.

First molars,	5th to 7th year.
Central incisors,	7th to 8th year.
Lateral incisors,	8th to 9th year.
First bicuspids,	9th to 10th year.
Second bicuspids,	10th to 11th year.
Canines,	11th to 12th year.
Second molars,	12th to 13th year.
Third molars,	17th to 21st year.

THE USE OF THE THERMOMETER IN DISEASE.

The thermometer is a useful aid in diagnosis and prognosis making exact that information which every physician constantly obtains by the touch. It is especially valuable in the clinical study of febrile disorders, as, since Galen, fever is essentially defined by the words, "preternatural heat."

The *axilla* is the best part for examination of temperature. The instrument should be kept there from three to five minutes at a time. Normally in the armpit the temperature averages 98.4° Fahr., with a range in health (Davy) from 9.99° to 97.92°. It is about 1° higher in tropical than in temperate climates. In the temperate it is *highest* on waking in the early morning, lowest at midnight.

In tropical regions it is *lowest* in the early morning and highest during the day (Aitkens). It is only one or two degrees higher in children than in adults.

A rise in temperature in disease of 1° Fahr. corresponds as a rule, with an increase of the pulse of eight to ten beats per minute. The thermometer in the axilla may, in some febrile cases, mark 100°, 108°, even 112°. It has been found highest in scarlet fever, yellow fever, (Dowler), and tetanus. Dr. H. C. Wood, Jr., found it 109° in the axilla of a man dying with heat-stroke, and 110¾° in his abdomen after death.

In intermittent fever, during the paroxysm, even when the patient shivers and feels cold to himself, his heat by the thermometer is always above the natural degree.

When the temperature is increased beyond 98.5°, it merely shows that the individual is ill; when it is raised as high as 101-105°, the febrile phenomena are severe; if above 105°, the patient is in imminent danger; with 108° or 109° a fatal issue may without doubt be expected in a comparatively short time. A person, yesterday healthy, who exhibits this morning a temperature above 104° F., is almost certainly the subject of an attack of ephemeral fever or of ague; should the temperature rise to or beyond 106.3°, the case will certainly turn out one of some form of malarious fever. It cannot be typhoid fever.

A patient whose temperature rises during the first day of illness up to 105° or 106° F., certainly does not suffer from typus or typhoid fever. In a patient who exhibits the general typical signs of pneumonia, but whose temperature never reaches 101.7° F., it may be concluded that no soft infiltrating exudation is present in the lung

If a patient suffers from measles and retains a high temperature after the eruption has faded, it may be concluded that some complicating disturbance is present.

In typhoid fever, temperature which does not exceed any evening 103.5° indicates a probably mild course of the fever; 105° in the evening, or 104° in the morning, shows danger in the third week. In pneumonia, a temperature of 104°, and upward of 104°, is always an alarming symptom, foreboding danger or some complication, such as pericardial inflammation. In jaundice, otherwise mild, a rise of temperature indicates a pernicious turn. In a puerperal female an increase of temperature shows approaching pelvic inflammation. In turberculosis an increase of temperature shows that the disease is advancing, or that untoward complications are setting in.

A fever temperature of 104° to 105° F., in any disease indicates that its progress is not checked, and complications may still occur.

Certain diseases have been found to have *typical* ranges or daily fluctuations of temperature throughout their course, so that their "differential diagnoses" may be thus assisted materially. This has now been determined, especially in malarial fever, typhus, typhoid, small-pox, scarlatina, measles, rheumatism, pyæmia, pneumonia and acute tuberculosis. Dr. Da-Costa has observed that in some cases, at least, cancer is attended by lowering of temperature.

In continued fevers the temperature is generally less high in the morning than in the evening. Stability of temperature from morning to evening is a good sign; on the other hand, if a high temperature remains stable from evening till the morning, it is a sign that the patient is getting, or will get worse.

When the temperature begins to fall from the evening to the morning, it is a sure sign of improvement; but a rise of temperature from the evening till the morning is a sign of his getting worse.

Convalescence from disease does not begin until the normal temperature of the body returns, and maintains itself unchanged through all periods of the day and night.

RESPIRATIONS AT VARIOUS AGES.

First year,	35.
Second year.	25.
At puberty,	20.
Adult age,	18. per minute.

THE PULSE.

Average frequency at different ages,—in health.

Ages.	*Beats per Minute.*
In the fœtus, *in utero,*	Between 150 and 140.
New-born infants,	" 140 and 130.
During 1st year,	From 130 down to 115.
" 2d year,	" 115 " " 100.
" 3d year,	" 105 " " 95.
From 7th to 14th year,	" 90 " " 80.
" 14th to 21st year,	" 85 " " 75.
" 21st to 60th year,	Between 75 and 79.
In old age,	" 75 " 80.

The pulse is generally more *frequent in females* by ten to fourteen beats per minute; *during* and *after exertion* unless long continued; *during digestion*, or *mental excitement*; generally, more frequent *in the morning*; and less frequent in health, *in the nervous* as well as in the *phlegmatic* temperament.

NOTES ON

EXAMINATION OF THE URINE.[*]

PREPARED BY JUDSON DALAND, M.D.,

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BASED UPON PROF. JAMES TYSON'S "HAND-BOOK FOR PRACTICAL EXAMINATION OF URINE."—SEVENTH EDITION.

In the examination of urine, the following are the steps found most convenient in actual practice. Observe:—

I. The quantity passed in twenty-four hours.
II. Color and transparency.
III. Odor.
IV. Reaction.
V. Specific gravity.
VI. Presence or absence of sediment, its quantity and character.
VII. Presence or absence of albumin.
VIII. Presence or absence of sugar.

HEAT AND ACID TEST.

The best test for determining the presence of albumin in urine is heat, corroborated by nitric acid. To apply this test, fill a test-tube one-fourth its depth with *perfectly clear urine*, to which, if it be not distinctly acid in reaction, *a drop or two* of acetic acid is added—only enough to make it clearly acid—and the fluid boiled over a spirit lamp. If an opacity results, the slightest degree of which becomes visible in a clear urine held in a good light, it is due either to *albumin* or *earthy phosphates*. If the latter, it promptly disappears on the addition of a few drops of nitric acid; *if albumin, it is permanent.*

Acetic acid is preferred to nitric for acidulating the urine, because not only is it true that a small quantity of albumin is dissolved by a large amount of nitric acid, but also that if a drop or two of nitric acid be added to a specimen of albuminous urine, so as to render it distinctly acid, it may happen, on boiling, that no precipitate will appear, although much albumin is present. This is because the serum-albumin is converted into acid-albumin or syntonin, which is not coagulated by heat.

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[*] The following is taken from the Physicians' visiting list for 1892. (Lindsay & Blakeston's.)

THE NITRIC ACID TEST.

This is best applied according to Heller's method. Upon a convenient quantity of pure, colorless nitric acid in a small test-tube, allow to trickle from a pipette, down the side of the inclined glass, an equal amount of clear urine, which will thus overlie the acid. If albumin is present, there appears at the point of contact between the urine and nitric acid a sharp white band or zone, of varying thickness, according to the quantity of albumin present.

Occasionally a somewhat similar white zone is formed by the action of nitric acid on the mixed urates if present in excess, by which the more insoluble acid urates are thrown down. This zone might be mistaken for that of albumin, but the acid urates begin to appear, not so much at the border, between the urine and acid, as higher up; nor does the zone on its upper surface remain so sharply defined, but, while under examination, is seen to diffuse itself into the urine above. Further, the application of heat causes its immediate disappearance.

Rarely the urine is so concentrated that nitric acid forms crystals of nitrate of urea, which, however, are dissolved by the application of heat.

THE PICRIC ACID TEST.

Into a test-tube, about six inches long, pour a four-inch column of *clear*, *transparent* urine; then, holding the tube in a slanting position, pour gently an inch of a saturated solution of picric acid on the surface of the urine, where, in consequence of its low specific gravity [1005], it mixes only with the upper layer of the urine.

As far as the yellow color of the picric acid solution extends, the coagulated albumin renders the liquid turbid, contrasting with the transparent urine below. For the action of the test, *there must be an actual mixture*, and not a mere surface contact. When, in consequence of the scantiness of the albumin, the turbidity is very slight, the application of heat to the upper part of the turbid column increases it. Then, if the tube be placed in a stand, the coagulated albumin will gradually subside, and, in the course of an hour or so, forms a delicate, horizontal film at the junction of the colored and unstained stratum of urine. No previous acidulation of the urine is required, as the picric acid accomplishes this, if needed. Urates, peptones and vegetable alkaloids, like quinine, morphine, etc., are precipitated by picric acid from urine containing them, but it should be remembered that the application of a *moderate* amount of heat will dissolve the ring thus formed.

BY FEHLING'S SOLUTION.

Place a small quantity of Fehling's solution in a test-tube, and dilute it with about four times its bulk of distilled water, and then boil the mixture for a few seconds. If a precipitate occur, the test solution is worthless, and a fresh supply obtained. To the *boiling*, *diluted*, *fresh Fehling's* *solution* add the suspected urine, drop by drop, and if sugar is present, a yellowish or reddish yellow precipitate, the suboxide of copper, appears. Whenever Fehling's solution shows the presence of sugar in the urine, this result should be corroborated by the application of the subnitrate of bismuth, or Botger's test, as follows:

SUBNITRATE OF BISMUTH TEST.

Add to urine an equal quantity of liquor potassæ or sodæ and a pinch of ordinary subnitrate of bismuth, and boil; when, if sugar is present, the subnitrate is converted into the black metallic bismuth. If the quantity of sugar is small, the bismuth assumes a grayish hue.

Before applying either of the above tests, albumin, if present, should always be removed by the addition of acetic acid, boiling and filtration.

It should be remembered that occasionally uric acid, creatinin, etc., have the power of reducing Fehling's solution, and thus leading us to erroneously believe sugar to be present.

THE PICRIC ACID AND POTASH TEST.

To a fluid drachm of suspected urine add 40 minims of a saturated solution of picric acid and half a drachm of liquor of potassæ. Boil this mixture, and, if sugar is present, a dark, mahogany-red color will be produced.

For quantitative work, perhaps the fermentation test can be most easily applied by the physician.

QUANTITATIVE DETERMINATION OF SUGAR BY THE FERMENTATION TEST.

Having taken the specific gravity of the urine, add a piece of compressed yeast about the size of a walnut, then place it in a warm place, about 80-90° F., for three or four hours, or until Fehling's solution shows no sugar. Allow the urine to cool to the original temperature, and again take the specific gravity. Multiply the number of degrees of specific gravity *lost* by .23, and the result is the percentage amount of sugar present.

ASPHYXIA AND APNŒA.

(*From Potter's Materia Medica.*)

FROM DROWNING.—Remove the person from the water as rapidly and gently as possible, turn the face downwards for a moment, and depress the tongue, in order that water, mucus, etc., may be removed immediately over the entrance of the windpipe. Give the patient plenty of fresh air, fully exposing neck and chest to the breeze, unless inclement. Turn gently on the face, one forearm being under the forehead, and raise the body up that the water may have free discharge from the mouth. Place patient upon the side and apply stimulants (ammonia, etc.) *near* the nostrils; or the cold douche, in order to excite respiration.

The above measures being ineffectual, convey the body to the nearest convenient spot, strip it carefully and dry it, and place it on a warm bed, with head and shoulders slightly raised, and at once employ one of the following methods:

Silvester's Method.—Pull the tongue forward, to prevent obstruction to entrance of air into the windpipe; produce expansion of the chest by drawing the arms from the sides of the body and upwards until they almost meet over the head. Then bring the arms down to the sides again, causing the elbows almost to meet over the pit of the stomach, and thus producing contraction of the chest. This imitation of the act of respiration should be continued at the rate of fifteen or sixteen times a minute, as in health.

Marshall Hall's Method.—The person should be placed flat on the face, gentle intermittant pressure being made with the hands on the back, the body turned on the side, or a little beyond, then on the face, and the same pressure, etc., continued as at first. The whole body must be worked simultaneously. The same number and frequency of these artificial processes of respiration should be employed as in the other method.

The Michigan Method.—Lay the body face down, the head upon the arm, and stand astride it; grasp it then about the shoulders and armpits and raise the chest as high as you can without lifting the head quite off the arm, and hold it about three seconds; then replace the body upon the ground, and press the lower ribs downwards and upwards, with slowly-increasing force, for ten seconds; then suddenly let go, to perform the lifting process again.

Whichever process be employed, the effort to restore the temperature of the body must be maintained, the body being well rubbed in an upward direction with the hands, with warm flannels, etc.; bottles of hot water, hot bricks, etc., being applied to the stomach, the axillæ, the soles of the feet, etc., stimulants and beef-tea being judiciously administered when restoration is about taking place. The attempts at resuscitation must be persevered in for several hours, if necessary.

Laryngotomy or tracheotomy, with or without catheterization, or forced insufflation of air or oxygen, have proved successful, as also electro-puncture [Garratt].

In artificial inflation, always press the larynx and trachea against the vertebral column, so as to close the œsophagus and thus prevent the air entering the stomach.

After Long Submersion is Recovery Possible?—According to Harley [p. 881], dogs kept under water 1½ minutes always died, if water had entered the lungs. If it had not, the trachea being plugged, they survived a submersion of 4 minutes. When persons rise after sinking they usually get some air, and less speedily come into a state from which recovery is impossible. The greatest period between the last inspiration and the stoppage of the heart is 4 minutes. Some think that no recovery has been made after complete cessation of the heart's action. We infer that after complete submersion for 5 minutes recovery is improbable, unless the person had been previously choked, or in a fainting state, so that no water entered the lungs. But in Anderson's case the patient had been under water at least 15 minutes, and in Garratt's the time was variously estimated at from 15 to 60 minutes.

When is a Case Hopeless?—Harley says [p. 892]: "If the eyes are open, the pupils dilated, the conjunctiva insensible, the countenance placid, the skin cold, frothy mucus round the nostrils and mouth, no attempt at respiration, and the heart's action inaudible [when the ear is applied to the chest], the case is hopeless."

SIGNS OF DEATH.—The following have been suggested as methods of deciding whether death has occurred:

[*a*] Tie a string firmly about the finger. If the end of the finger becomes swollen and red, life is not extinct.

[*b*] Insert a bright steel needle into the flesh. It it tarnishes by oxidation in the course of half an hour, life may be considered not extinct.

[*c*] Inject a few drops of Liquor Ammoniæ under the skin. During life a deep red or purple spot is formed.

[*d*] Moisten the eye with Atropine. During life the pupil will dilate.

[*e*] Look at a bright light or at the sun through the fingers held closely side by side. During life the color is pink; after death, a dead white.

[*f*] After death a dark spot is said to form gradually on the outer side of the white of the eye, from drying of the sclerotic, so that the dark chloride shows through.

[*g*] Putrefaction is an absolute sign of death. Better delay for it than run any risk of burying alive.

FROM FOREIGN BODIES IN AIR PASSAGES.—If round and smooth, invert the patient and strike on the back: laryngotomy: tracheotomy.

OF THE NEW BORN.—Clean the mucus out of nostrils and throat; catheterize the trachea, and suck up the mucus. "Marshall Hall's method:" by placing child on abdomen, then bringing into lateral posture, repeating slowly and deliberately. "Schultze's method:" by placing the thumbs upon the anterior surface of thorax, the indices in the axillæ, and the other fingers along the back, the face of the child being from you; rotate the child by swinging upwards, so that the inferior extremities turn over towards you. In a moment re-rotate to the original position. Do not support head or legs in the forward rotation; their bending upon or towards the abdomen gives a forced expiration.

COMPARISON OF THERMOMETERS.

From Gould's New Medical Dictionary.

Fahr.	Cent.	Reau.	Fahr.	Cent.	Reau.
212	100	80	76	24.4	19.6
210	98.9	79.1	74	23.3	18.7
208	97.8	78.2	72	22.2	17.8
206	96.7	77.3	70	21.1	16.9
204	95.6	76.4	68	20	16
202	94.4	75.6	66	18.9	15.1
200	93.3	74.7	64	17.8	14.2
198	92.2	73.8	62	16.7	13.3
196	91.1	72.9	60	15.6	12.4
194	90	72	58	14.4	11.6
192	88.9	71.1	56	13.3	10.7
190	87.8	70.2	54	12.2	9.8
188	86.7	69.3	52	11.1	8.9
186	85.6	68.4	50	10	8
184	84.4	67.6	48	8.9	7.1
182	83.3	66.7	46	7.8	6.2
180	82.2	65.8	44	6.7	5.3
178	81.1	64.9	42	5.6	4.4
176	80	64	40	4.4	3.6
174	78.9	63.1	38	3.3	2.7
172	77.8	62.2	36	2.2	1.8
170	76.7	61.3	34	1.1	0.9
168	75.6	60.4	32	0	0
166	74.4	59.6	30	1.1	-0.9
164	73.3	58.7	28	-2.2	-1.8
162	72.2	57.8	26	-3.3	-2.7
160	71.1	56.9	24	-4.4	-3.6
158	70	56	22	-5.6	-4.4
156	68.9	55.1	20	-6.7	-5.3
154	67.8	54.2	18	-7.8	6.2
152	66.7	53.3	16	-8.9	-7.1
150	65.6	52.4	14	-10	-8
148	64.4	51.6	12	-11.1	-8.9
146	63.3	50.7	10	-12.2	-9.8
144	62.2	49.8	8	-13.3	-10.7
142	61.1	48.9	6	-14.4	-11.6
140	60	48	4	-15.6	-12.4
138	58.9	47.1	2	-16.7	-13.3
136	57.8	46.2	0	-17.8	-14.2
134	56.7	45.3	-2	-18.9	-15.1
132	55.6	44.4	-4	-20	-16
130	54.4	43.6	-6	-21.1	-16.9
128	53.3	42.7	-8	-22.2	-17.8
126	52.2	41.8	-10	-23.3	-18.7
124	51.1	40.9	-12	-24.4	-19.6
122	50	40	-14	-25.6	-20.4
120	48.9	39.1	-16	-26.7	-21.3
118	47.8	38.2	-18	-27.8	-22.2
116	46.7	37.3	-20	-28.9	-23.1
114	45.6	36.4	-22	-30	-24
112	44.4	35.6	-24	-31.1	-24.9
110	43.3	34.7	-26	32.2	-25.8
108	42.2	33.8	-28	-33.3	-26.7
106	41.1	32.9	-30	-34.4	-27.6
104	40	32	-32	-35.6	-28.4
102	38.9	31.1	-34	-36.7	-29.3
100	37.8	30.2	-36	-37.8	-30.2
98	36.7	29.3	-38	38.9	-31.1
96	35.6	28.4	-40	-40	32
94	34.4	27.6	-42	-41.1	-32.9
92	33.3	26.7	-44	-42.2	-33.8
90	32.2	25.8	-46	-43.3	-34.7
88	31.1	24.9	-48	-44.4	-35.7
86	30	24	-50	-45.6	-36.4
84	28.9	23.1	-52	-46.7	-37.3
82	27.8	22.2	-54	-47.8	-38.2
80	26.7	21.3	-56	-48.9	39.1
78	25.6	20.4			

POSOLOGICAL TABLE.

(MEADOWS.)

The following Posological Table is taken from the Guy's Hospital Pharmacopœia. It is to be read as follows: Suppose that the maximum dose of a given liquid is one fluid ounce, the dose for an infant one month old is thirty minims. If the substance be a solid, and the maximum dose is sixty grains, then the dose for an infant of a month old is three grains, and so on for the several ages stated. The maximum doses are given at the top of each of the three columns, and the doses for the different ages are opposite to those ages.

AGE.	MAXIMUM DOSE.		
	One fluid ounce.	Twenty grains.	Sixty grains.
One month	minims 30	gr. 1	grs. 3
Three months	—	—	grs. 4
Six months	minims 40	grs. 2	grs. 6
Nine months	—	—	grs. 7
One year	fl. dr. j	grs. 3	grs. 8
Two years	fl. drs. iss	grs. 4	grs. 10
Three years	fl. drs. iss	grs. 4	grs. 12
Four years	fl. drs. ij	grs. 5	grs. 15
Five years	fl. drs. ijss	grs. 6	grs. 18
Six years	fl. drs. iij	grs. 7	grs. 20
Seven years	fl. drs. iijss	grs 8	grs. 25
Eight years	fl. oz. ss	grs. 10	grs. 30
Ten years	fl. drs. ivss	grs. 12	grs. 35
Twelve years	fl. drs. v	grs. 14	grs. 40
Thirteen years	fl. drs. vss	grs. 15	—
Fifteen years	fl. drs. vj	grs. 16	grs. 45
Eighteen years	fl. drs. vjss	grs. 17	—
Twenty years	fl. drs. vij	grs. 18	grs. 50
Twenty to forty-five years	fl. oz. j	grs. 20	grs. 60
Fifty years	fl. drs. vij	grs. 18	grs. 50
Sixty to seventy years	fl. drs. vj	grs. 16	grs. 45
Eighty to ninety years	fl. drs. v	grs. 14	grs. 40
One hundred years	fl. oz. ss	grs. 10	grs. 30

TABLE FOR CONVERTING APOTHECARIES' WEIGHTS AND MEASURES INTO GRAMS.

Troy Weight.	Metric.	Apothecaries' Measure.	Grams for Liquids.		
Grains.	Grams.		Lighter* than Water.	Specific Gravity † of Water.	Heavier ‡ than Water.
$\frac{1}{400}$	.00016	♏ 1	.055	.06	08
$\frac{1}{200}$	.00033	2	.10	.12	15
$\frac{1}{128}$	.0005	3	.16	.18	24
$\frac{1}{100}$	.00065	4	.22	.24	.32
$\frac{1}{64}$	.001	5	.28	.30	.40
$\frac{1}{40}$	.0015	6	.32	.36	.48
$\frac{1}{30}$	.002	7	.38	.42	.55
$\frac{1}{20}$	.003	8	.45	.50	.65
$\frac{1}{16}$	.004	9	.50	.55	.73
$\frac{1}{12}$	.005	10	.55	.60	.80
$\frac{1}{10}$	.006	15	.80	.72	.96
$\frac{1}{8}$	.008	16	.90	1.00	1.32
$\frac{1}{6}$	.010	20	1.12	1.25	1.60
$\frac{1}{4}$	.016	25	1.40	1.55	2.00
$\frac{1}{3}$	.02	30	1.70	1.90	2.50
$\frac{1}{2}$	.03	35	2.00	2.20	2.90
1	.065	40	2.25	2.50	3.30
2	.13	48	2.70	3.00	4.00
3	.20	50	2.80	3.12	4.15
4	.26	60 fʒj	3.40	3.75	5.00
5	.32	72	4.00	4.50	6.00
6	.39	80	4.50	5.00	6.65
0	.52	90	5.10	5.60	7.50
10	.65	96	5.40	6.00	8.00
15	1.00	100	5.60	6.25	8.30
20 ℈j	1.30	120 fʒij	6.75	7.50	10.00
24	1.50	160	9.00	10.00	13.30
26	1.62	180 fʒiij	10.10	11.25	15.00
30 ʒss	1.95	240 f℥ss	13.50	15.00	20.00
40	2.60	fʒv	16.90	18.75	25.00
50	3.20	fʒvj	20.25	22.50	30.00
60 ʒj	3.90	fʒvij	23.60	26.25	35.00
120 ʒij	7.80	f℥j	27.00	30.00	40.00
180	11.65	f℥ij	54.00	60.00	80.00
240 ℥ss	15.50	f℥iij	81.00	90.00	120.00
300	19.40	f℥iv	108.00	120.00	160.00
360	23.30	f℥v	135.00	150.00	200.00
420	27.20	f℥vii	162.00	180.00	240.00
480 ℥j	31.10	f℥viij	216.00	240.00	320.00

* Lighter than water are tinctures, spirits, compound spirit of ether, sweet spirit nitre, fixed and volatile oils. Æther Fortior, fʒj=grams 2.80.

† Same as water are waters, liquids, decoctions, infusions, most fluid extracts, and tinctures made with dilute alcohol.

‡ Heavier than water are syrups, glycerin, a few fluid extracts, and chloroform. Of the latter, fʒj=grams 5.50.

POISONS AND ANTIDOTES.

REVISED FOR 1892.

POISON.	ANTIDOTE.
ACIDS, MINERAL	Chalk, magnesia (plaster off wall in emergency), solution carbonate of soda, emollient drinks, fixed oils.
ACONITE	Emetics, stimulants, external and internal, keep up external heat, keep flat on back.
ANTIM. TART	Vegetable acids, such as *tannic acid*, catechu.
ARSENIC	Freshly precipitated hydrated sesquioxide of iron made by adding magnesia of iron to any iron solution.
ATROPIA	Same as Belladonna.
ARGENTIC NITRATE	Solution of common salt and demulcent drinks. Emetics.
BELLADONNA	Emetics—mustard flour in water; give physostigma or pilocarpine; cold to head.
CANTHARIDES	Emetics, emollient drinks, opiates by mouth and rectum, large draughts of water to flush kidneys.
CARBOLIC ACID	Any soluble sulphate such as magnesia.
CHLORINE WATER	Albumen, white of egg, milk, flour.
CHLOROFORM	Fresh air, artificial respiration (inclining head down, pull tongue forward], brandy and ammonia intravenously in leg, the *hypodermic* injection of 15 ♏ tincture of digitalis and $\frac{1}{60}$ of a grain of atropine.
COLCHICUM	Emetics, followed by demulcent drinks. If *coma* be present, brandy, ammonia, coffee. Opium in large dose. Keep up external heat.
CONIUM	Emetics, followed by stimulants external and internal.
CORROSIVE SUBLIMATE	Albumen, white of egg [4 gr. sublimate require white of one egg], flour, milk. Equal parts of lime water and milk. Emetics, or evacuate stomach by pump.
CROTON OIL	Emetics; wash out stomach, followed by mucilaginous fluids, containing opium.

POISONS AND ANTIDOTES.—Continued.

POISON.	ANTIDOTE.
CUPRI SULPH	Yellow prussiate of potash or soap.
DIGITALIS	Recumbent posture after emetics. Emetics and opium; give tincture aconite.
ELATERIUM	Demulcent drinks, enemata of opium, and external heat.
HYDROCYANIC ACID	Fresh air and artificial respiration, with cold effusion. Ammonia by inhalation and intravenously in vein of leg.
HYOSCYAMUS	Stomach pump, emetics, stimulants external and internal, physostigma and pilocarpine.
ILLUMINATING GAS	Hypodermatic injections of nitro-glycerin are recommended by Kloman, of Baltimore.
IODINE	Emetics and demulcent drinks, starch or flour diffused in water, opium and external heat.
LEAD SALTS	Any soluble sulphate, either magnesia or soda, succeeded by emetics, and afterwards by opium and milk.
LOBELIA	Stimulants externally and internally; external heat.
MORPHINE	Same as Opium.
NUX VOMICA	30 grs. of chloral and 60 grs. of bromide of potash. Nitrite of amyl.
OPIUM	Atropine hypodermatically till respirations number 8 per minute. Stomach pump, stimulants, external and internal, brandy and coffee, cold affusion, ammonia to nostrils, galvanic shocks, compelling to move about, artificial respiration, electric brush.
OXALIC ACID	Lime, not potash or soda.
PHOSPHORUS	Sulphate of copper in emetic dose as chemical antidote. No oils. Emetics, and purgatives.
POTASH AND SODA SALTS	Dilute acetic acid, citric acid, lemon juice, fixed oils, demulcents, vinegar.
STRAMONIUM	Same as Belladonna.
STRYCHNINE	Same as nux vomica.
TOBACCO	Emetic, stimulants external and internal, strychnine, external heat.
ZINC SALTS	Carbonate of soda, emetics, warm demulcent drinks.

DOSE TABLE.

GIVING THE DOSES OF OFFICIAL AND UNOFFICIAL DRUGS IN BOTH THE ENGLISH AND METRIC SYSTEMS.

(THE PHYSICIANS' VISITING LIST, 1892.)

THOROUGHLY REVISED AND CORRECTED BY GEORGE M. GOULD, M.D., OPHTHALMIC SURGEON TO THE PHILADELPHIA HOSPITAL,
AUTHOR OF "A NEW MEDICAL DICTIONARY," ETC.

The Doses given are for adults; for children the following rule (Young's) will be found the most convenient. Add 12 to the age, and divide by the age, to get the denominator of the fraction, the numerator of which is 1 Thus, for a child two years old, $\frac{2+12}{2}=7$ and the dose is one-seventh of that for an adult. Of powerful narcotics scarcely more than one-half of this proportion should be used. Of mild cathartics, two or even three times the proportion may be employed.

In a general way it may be said that approximately the dose for a child of one month is $\frac{1}{20}$ that of an adult; for one 3 months, $\frac{1}{15}$; 6 months, $\frac{1}{10}$; 1 year, ⅛; 2 years, $\frac{1}{6}$; 3 years, $\frac{1}{5}$; 5 years, $\frac{3}{10}$; 8 years, ½; 10 years, $\frac{3}{5}$; 12 years, ⅔; 15 years, $\frac{4}{5}$; 20 to 45 years, adult dosage; 50 years, $\frac{5}{6}$; 60 years, $\frac{4}{5}$; 80 years, ⅔.

For Hypodermatic Injection, the dose should be one-half of that used by the mouth; by rectum, five fourths of the same. The letters gr. stand for grains; ♏, minims; ʒ, drachms; ℥, ounces; gm., grams; cgm., centigrams.

REMEDIES.	DOSE APOTH.	DOSE METRIC.	REMEDIES.	DOSE APOTH.	DOSE METRIC.
Abstract.			Abstract.		
aconiti	gr. ¼-½	0.016–0.033	ignatiæ	gr. 1-3	0.066–0.200
aspidosperm	" 5-20	0.333–1.333	ipecac	" 3-30	0.200–2.000
belladonnæ	" ½-1½	0.033–0.100	jalapæ	" 6-10	0.400–0.666
cannab. ind	" 1-3	0.033–0.200	nuc. vom	" ¼-½	0.016–0.033
conii	" 1-2	0.666–0.133	phytolaccæ	" 5-15	0.333–1.000
digitalis	" 1-3	0.066–0.200	pilocarpi	" 6-30	0.400–2.000
gelsemii	" 1-3	6.066–0.200	podophylli	" 4-10	0.266–0.666
hyoscyami	" 2-5	0.133–0.333	senegæ	" 4-10	0.266–0.666

Remedies.	Dose Apoth.	Dose Metric.	Remedies.	Dose Apoth.	Dose Metric.
Abstract.					
valerianæ	gr. 10-15	0.666–1.000	Aconit. (white crystals)	gr. $\frac{1}{400}$-$\frac{1}{200}$	0.000167–0.0003
veratr. vir	“ 1- 3	0.066–0.200	Adonidin	“ $\frac{1}{16}$-$\frac{1}{10}$	0.004–0.006
Acet. lobeliæ	♏ 15-30	1.000–2.000	Aloe	“ 2- 5	0.133–0.333
opii	“ 5-16	0.333–1.066	Aloinum	“ 1- 3	0.066–0.200
sanguinar	“ 15-30	1.000–2.000	Alumen	“ 10-15	0.666–1.000
scillæ	“ 10-30	0.666–2.000	Ammonii benzoas	“ 10-20	0.666–1.333
Acid. acet. dil	“ 60-90	4.000–6.000	bromid	“ 5-30	0.333–2.000
arsenios	gr. $\frac{1}{64}$-$\frac{1}{20}$	0.001–0.003	carb	“ 3-10	0.200–0.666
benzoic	“ 5-15	0.333–1.000	chlorid	“ 10-30	0.666–2.000
boric	“ 5-10	0.333–0.666	iodid	“ 3-15	0.200–1.000
carbolic	“ 1- 3	0.066–0.200	phosph	“ 5-20	0.333–1.333
gallic	“ 3-15	0.200–1.000	picras	“ ¼-½	0.016–0.033
gall. in albuminuria	“ 10-60	0.666–4.000	sulph	“ 3-15	0.200–1.000
hydrobrom. 34 per cent	“ 10-15	0.666–1.000	valer	“ 3-15	0.200–1.000
hydrobrom dil	♏ 40-12	2.666–8.000	Amyl nitris	♏ 2- 5	0.133–0.333
hydrochlor	“ 3-10	0.200–0.666	Amylum iodatum	gr. 3-30	0.200–2.000
hydrochlor. dil	“ 10-30	0.666–2.000	Antifebrin	“ 2-15	0.133–1.000
hydrocyan. dil	“ 2- 6	0.133–0.400	Antimonii et pot. tartr. diaph.	“ $\frac{1}{20}$-$\frac{1}{12}$	0.003–0.005
lactic	gr. 15-60	1.000–4.000	et pot. tartr. emetic	“ 1- 2	0.066–0.133
nitr	♏ 3-10	0.200–0.666	oxid	“ 1½- 2	0.100–0.133
nitr. dil	“ 10-30	0.666–2.000	oxysulphur	“ ½- 2	0.033–0.133
nitro-hydrochlor	“ 3-10	0.200–0.666	sulphid	“ ½- 2	0.033–0.133
nitro-hydrochlor. dil	“ 5-20	0.333–1.333	sulphuret	“ ½- 2	0.033–0.133
phosphoric 50 per cent	gr. 3-15	0.200–1.000	Antipyrin	“ 10-20	0.666–1.333
phosphoric dil	♏ 10-30	0.666–2.000	Apiol	“ 3- 5	0.200–0.333
salicylic	gr. 5-20	0.333–1.333	Apomorph. hydrochlor	“ $\frac{1}{30}$-$\frac{1}{10}$	0.002–0.006
sulphuric	♏ 5-10	0.333–0.666	Aqua ammon	♏ 6-30	0.400–2.000
sulph. dil	“ 5-30	0.333–2.000	amygd. amar	ʒ 2- 4	8.000–16.000
sulphuric arom	“ 5-10	0.333–0.666	camphoræ	ʒ ½- 2	16.000–64.000
sulphur	♏ 30-60	2.000–4.000	chlori	ʒ 1- 4	4.000–16.000
tannic	gr. 2-10	0.133–0.666	creasoti	“ 1- 4	4.000–16.000

REMEDIES.	DOSE. APOTH.	DOSE. METRIC.	REMEDIES.	DOSE. APOTH.	DOSE. METRIC.
laurocerasi	♏ 6-30	0.400–2.000	Cerii nitras	" 1-3	0.066–0.200
Argenti iodid	gr. ½- 2	0.033–0.133	oxalas	" 1-3	0.066-0.200
nitras	" $\frac{1}{6}$-⅓	0.011–0.022	Chinoidinum	" 3-30	0.200-2.000
oxid	" ½- 2	0.033–0.133	Chloral	" 3-20	0.200-1.333
Arsenii iodid	" $\frac{1}{64}$-$\frac{1}{10}$	0.001–0.006	Chloroformum	♏ 1- 5	0.066-0.333
Assafœtida	" 5- 20	0.333–1.333	Chrysarobin	gr. 3-15	0.200-1.000
Atropina	" $\frac{1}{128}$-$\frac{1}{32}$	0.0005–0.002	Cinchona	" 15-60	1.000-4.000
Atropinæ sulp	" $\frac{1}{128}$-$\frac{1}{32}$	0.0005–0.002	Cinchonidina and its salts	" 1-30	0.066-2.000
Auri et sodii chlorid	" $\frac{1}{32}$-$\frac{1}{16}$	0.002–0.004	Cinchonina and its salts	" 1-30	0.066-2.000
Berberinaa sul	" 3-10	0.200–0.666	Cinnamomum	" 6-30	0.400-2.000
Berberina and its salts	" 3-15	0.200–1.000	Cocaine sol. p. c	" 1- 4	
Bismuth citr	" 3-15	0.200–1.000	Codeina	" ½- 2	0.033-0.133
et ammon citr	" 1-15	0.066–1.000	Confectio sen	" 1- 2	0.066-0.133
subcarb	" 6-30	0.400–2.000	Coniina and its salts	" $\frac{1}{64}$-$\frac{1}{32}$	0.001-0.002
subnitr	" 30-60	2.000–4.000	Copaiba	♏ 15-60	1.000-4.000
tannas	" 6-30	0.400–2.000	Cota	gr. 1- 2	0.066-0.133
valer	" 1- 3	0.066–0.200	Cotoina	" $\frac{1}{6}$-½	0.011-0.033
Brayera	ʒ 2- 6	8.000–24.000	Creasotum	♏ 1- 3	0.066-0.200
Brucina	gr. $\frac{1}{64}$-$\frac{1}{16}$	0.001–0.004	Creta præpar	gr. 15-75	1.000-5.000
Caffeina	" 1- 5	0.066–0.333	Croton chloral	" 1- 5	0.066-0.333
Caffeinæ citras	" 1- 5	0.066–0.333	Cubeba	" 15-60	1.000-4.000
Calcii bromid	" 5-30	0.333–2.000	Cupri acetas	" $\frac{1}{10}$-¼	0.006-0.016
carb	" 15-60	1.000–4.000	sulphas	" ¼-½	0.016-0.033
hypophosph	" 3-15	0.200–1.000	Cupri am	" $\frac{1}{6}$-1	0.011-0.066
iodidum	" 1- 3	0.066–0.200	Curare	" $\frac{1}{32}$-$\frac{1}{6}$	0.002-0.011
Calcii phosph	" 15-30	1.000–2.000	Curarina	" $\frac{1}{64}$-$\frac{1}{20}$	0.001·0.003
Calx sulphur	" ⅓- 1	0.022–0.066	Daturine	" $\frac{1}{100}$-$\frac{1}{50}$	0.00067-0.00134
Camphora	" 3-10	0.200–0–666	Decoct. aloes comp	℥ ½- 2	16.000-64.000
Camph monob	" 2- 5	0.133–0.333	sarsap. comp	" 2- 6	64.000-192.000
Cantharis	" ½- 2	0.033–0.133	Digitalinum	gr. $\frac{1}{64}$-$\frac{1}{32}$	0.001-0.002
Capsicum	" 1- 3	0.066–0.200	Digitalis	" ½- 2	0.033-0.133
Castoreum	" 6-15	0.400–1.000	Duboisina and its salts	" $\frac{1}{128}$-$\frac{1}{60}$	0.0005-0.001
Catechu	" 15-30	1.000.2.000	Elaterinum; U. S. P. 1880	" $\frac{1}{60}$-$\frac{1}{18}$	0.001-0.000

REMEDIES.	DOSE APOTH.	DOSE METRIC.	REMEDIES.	DOSE APOTH.	DOSE METRIC.
Elaterium; U. S. P. 1870	" 1/10-1/6	0.0066-0.011	arnicæ fl.	♏ 5-15	0.333-1.000
Emetina and salts, emet	" ⅛-¼	0.008-0.016	arnicæ rad	gr. 2- 5	0.133-0.333
and salts, diaph	" 1/120-1/30	0.0005-0.002	arnicæ rad. fl.	♏ 5-15	0.333-1.000
Emulsio hydrocyan	ʒ ½- 1	2.000-4.000	aromat. fl.	" 30-60	2 000-4.000
Ergota	gr. 15-60	1.000-4.000	ari triphylli fl.	" 15-30	1.000-2.000
Ergotinum	" 2- 8	0.133-0.533	asari fl.	" 15-30	1.000-2.000
Eserina, and its salts	" 1/64-1/20	0.001-0.003	asclep. incar. fl.	" 15-30	1.000-2.000
Extr. absinthii	" 2- 6	0.133-0.400	asclep. syr. fl.	" 15-30	1.000-2.000
absinth fluid	♏ 15-30	1.000-2.000	asclep. tuber. fl.	15-30	1.000-2.000
achilleæ	gr. 3-10	0.2000-0.666	aspidii fl.	ʒ 1- 4	4.000-16.000
achilleæ fluid	♏ 15-60	1.000-4.000	aspidosperm. fl.	♏ 15-45	1.000-3.000
aconiti fol. (Engl.)	gr. ⅓-½	0.022-0.033	aurantii cort. fl.	ʒ ¼- 2½	1.000-10.000
aconiti fol.; U. S. P. 1870	" ⅓-½	0.022-0.033	azedarach fl.	♏ 15-75	1.000-5.000
aconiti fol. fluid	♏ 1- 5	0.066-0.333	baptisiæ fl.	" 7-30	0.466-2.000
aconiti rad.; U. S. P. 1880	gr. 1/12-¼	0.005-0.016	bellad. alcohol	gr. 1/6-½	0.011-0.033
aconiti [rad fluid]	♏ ½- 2½	0.033-0.166	bellad. fol. [Engl.]	" 1/6-⅔	0.011-0.044
aletridis fl.	" 15-30	1.000-2.000	bellad. fol. fl.	♏ 3- 6	0.200-0.400
alni rub. fl.	" 15-30	1.000-2.000	bellad. rad	gr. ⅛-¼	0.008-0.016
aloes aquos	gr. ½- 3	0.033-0.200	bellad. rad. fl.	♏ 1- 3	0.066-0.200
alston const. fl.	ʒ 1- 4	4.000-16.000	berber. aqui fol. fl.	" 15-30	1.000-2.000
angelicæ rad fl.	♏ 30-60	2.000-4.000	berber vulg. fl.	" 15-30	1.000-2.000
angusturæ fl.	" 15-45	1.000-3.000	boldi fl.	" 3-15	0.200-1.000
anthemidis	gr. 2-10	0.133-0.666	brayeræ fl.	ʒ 2- 4	8.000-16.000
anthemidis fl.	♏ 30-60	2.000-4.000	bryoniæ fl.	♏ 15-60	1.000-4.000
apocyni andros fl.	" 8-50	0.533-3.333	buchu fl.	ʒ ½- 2½	2.000-10.000
apocyni cannab. fl.	" 8-30	0.533-2.000	calami fl.	♏ 15-60	1.000-4.000
araliæ hisp. fl.	" 30-60	2.000-4.000	calend. fl.	" 15-60	1.000-4.000
araliæ nudic. fl.	" 30-60	2.000-4.000	calumbæ	gr. 3-10	0 200-0.666
araliæ racem	" 30-60	2.000-4.000	calumbæ fl.	♏ 15-60	1.000-4.000
araliæ spin. fl.	" 30-60	2.000-4.000	canellæ fl.	" 15-60	1.000-4.000
arecæ fl.	" 45-75	3.000-5.000	cannab. Am. fl.	" 3-15	0.200-1.000
arnicæ flor	gr. 3- 8	0.200-0.533	cannab. ind	gr. 1/6-½	0.011-0.033

REMEDIES.	DOSE APOTH.	DOSE METRIC.	REMEDIES.	DOSE APOTH.	DOSE. METRIC.
Extr. cannab. ind. fl.	♏ 3- 6	0.200-0.400	Extr. conii fol. fl.	♏ 1- 2	0.066-0.133
capsici fl.	" 1- 3	0.066-0.200	con. [fr.] fl.; U. S. P. 1880	" 1½- 5	0.100-0.333
cardam comp. fl.	♏ 15-45	1.000-3.000	convallariæ rad. fl.	" 15-30	1.000-2.000
ardui ben. fl.	" 15-60	1.000-4.000	coptidis fl.	" 30-60	2.000-4.000
arnis	gr. 15-60	1.000-4.000	corn. flor. fl.	" 30-60	2.000-4.000
ascara sagrad. fl.	♏ 10-20	0.666-1.333	corydalis fl.	" 15-30	1.000.2.000
ascarillæ fl.	ʒ ¾-2⅓	3.000-10.000	coto fl.	" 3-15	0.200.1.000
astaneæ fl.	" ¾-2½	3.000-10.000	cubebæ fl.	" 15-30	1.000.2.000
atariæ fl.	" ¼-1¼	1.000-5.000	cypripedii fl.	" 15-60	1.000-4.000
catechu liq.	♏ 8-30	0.533-2.000	damianæ fl.	ʒ ½-2½	2.000-10.000
caulophylli fl.	" 15-30	1.000-2.000	delphinii fl.	♏ 1- 3	0.066-0.200
chelidonii fl.	" 15-30	1.000-2.000	digitalis	gr. ⅛-½	0.011-0.033
chelonis fl.	" 30-60	2.000-4.000	digitalis fl.	♏ 1- 6	0.066-0.400
chimaph fl.	ʒ ¾-1¼	3.000-5.000	dioscoreæ fl.	" 15-30	1.000-2.000
chionanthi fl.	" ¾-2½	3.000-10.000	ditæ fl.	ʒ 1- 4	4.000-16.000
chrittæ fl.	" ½-1¼	2.000-5.000	dracontii fl.	gr. 30-60	2.000-4.000
cimicifugæ fl.	♏ 8-30	0.533-2.000	droseræ fl.	♏ 5-10	0.333.0.666
cinchoniæ	gr. 15-30	1.000-2.000	dulcamaræ	gr. 5-15	0.333-1.000
cinchoniæ fl.	♏ 30-60	2.000-4.000	dulcamaræ fl.	ʒ 1- 2	4.000-8.000
cinchoniæ arom. fl.	" 30-60	2.000-4.000	ergotæ	gr. 1½- 8	0.100-0.533
cinchoniæ comp. fl.	ʒ ½- 1¼	2.000-5.000	ergotæ fl.	♏ 15-60	1.000-4.000
cocculi fl.	♏ 1- 3	0.066-0.200	cryodictyi fl.	" 15-30	1.000-2.000
colch. rad.	gr. ⅓- 1½	0.022-0.100	erythroxyli fl.	ʒ ½- 2	2.000-8.000
colch. rad. fl.	♏ 2- 4	0.133-0.266	eucalypti fl.	♏ 15-60	1.000-4.000
colch. sem. fl.	" 1½- 6	0.100-0.400	euonymi fl.	" 15-60	1.000-4.000
collinsoniæ fl.	" 30-60	2.000-4.000	eupatorii fl.	" 30-60	2.000-4.000
colocynth	gr. 1½- 5	0.100-0.333	euphorb. ipec. fl.	" 5-30	0.333-2.000
colocynth comp.	" 1½- 5	0-100-0.333	ferri pom.	gr. 3-15	0.200.1.000
condurango fl.	♏ 8-30	0.533-2.000	Extr. frangulæ fl.	ʒ ½-2½	2.000-10.000
conii fol. [Eng.]	gr. 1- 4	0.066-0.266	frankeniæ fl.	♏ 8-15	0.533-1.000
conii fol. alc.; U. S. P. 1870	" 1- 1½	0.066-0.100	gallæ fl.	ʒ ¾- 2	3.000-8.000
con. [fr.] alc.; U. S. P. 1880	" ⅓- 1	0.022-0.066	gelsemii	♏ 2- 8	0.133-0.533

Remedies.	Dose. Apoth.	Dose. Metric.	Remedies.	Dose. Apoth.	Dose. Metric.
Extr. gelsemii fl.	♏ 5–20	0.333–1.333	Extr. iridis versic.	gr. 3– 6	0.200–0.400
gent. fl.	" 30–60	2.000–4.000	irid. versic. fl.	♏ 15–30	1.000–2.000
gent. com. fl.	" 30–60	2.000–4.000	jaborandi fl.	" 10–60	0.666–4.000
gent. quin. fl.	" 15–30	1.000–2.000	jalapæ; U. S. P. 1870.	gr. 5–10	0.333–0.666
geranii fl.	" 15–30	1.000–2.000	jalapæ alc.	" 3– 6	0.200–0.400
gei fl.	" 15–30	1.000–2.000	jalapæ fl.	♏ 15–30	1.000–2.000
gilleniæ fl.	" 15–30	1.000–2.000	juglandis	gr. 15–30	1.000–2.000
gossypii fl.	" 15–45	1.000–3.000	juglandis fl.	ʒ ¾– 2	3.000–8.000
granati rad. cort. fl.	ʒ ¾– 2	3.000–8.000	junip fl.	♏ 30–60	2.000–4.000
grind. rob. fl.	♏ 30–60	2.000–4.000	kamala fl.	" 30–60	2.000–4.000
grind. squar. fl.	" 30–60	2.000–4.000	kino, liquid	" 15–30	1.000–2.000
guaiaci ligni fl.	" 30–60	2.000–4.000	krameriæ	gr. 5–15	0.333–1.000
guaranæ fl.	" 15–30	1.000–2.000	krameriæ fl.	♏ 30–60	2.000–4.000
hæmatoxyli	gr. 8–30	0.533–2.000	lactucæ	gr. 5–15	0.333–1.000
hæmatoxyli fl.	♏ 30–60	2.000–4.000	lactucæ fl.	♏ 15–60	1.000–4.000
hamamelid fl.	" 30–90	2.000–6.000	lactucarii fl.	" 8–30	0.533–2.000
helleb. nigris.	gr. ½– 3	0.033–0.200	lappæ fl.	ʒ 1– 2	4.000–8.000
helleb nigris fl.	♏ 5–15	0.333–1.000	laricis fl.	" ½– 2	2.000–8.000
heloniæ fl.	" 8–30	0.533–2.000	leonuri fl.	♏ 30–60	2.000–4.000
hepaticæ fl.	" 30–60	2.000–4.000	leptandræ	gr. 3–10	0.200–0.666
humuli	gr. 3–15	0.200–1.000	leptandræ fl.	♏ 30–60	2.000–4.000
humuli fl.	♏ 30–60	2.000–4.000	lobeliæ fl.	" 1– 5	0.066–0.333
hydrangeæ fl.	" 30–60	2.000–4.000	lupulini fl.	" 5–15	0.333–1.000
hydrastis	gr. 3–10	0.200–0.666	lycopi fl.	♏ 5–30	0.333–2.000
hydrastis fl.	♏ 8–30	0.533–2.000	malti	ʒ 1– 2½	4.000–10.000
hyoscyami [Engl.]	gr. 1– 4	0.066–0.266	manzanitæ fl.	" ½– 2	2.000–8.000
hyoscyami alc.	" 1– 2	0.066–0.133	marrubii fl.	" 1– 2	4.000.8.000
hyoscyami fol. fl.	♏ 3–15	0.200–1.000	maticofl.	♏ 30–60	2.000–4.000
hyoscyami sem. fl.	" 2– 8	0.133–0.533	matricariæ.	" 8–30	0.533–2.000
ignatiæ.	gr. ¼–½	0.016–0.033	menisperm. fl.	" 30–60	2.000–4.000
ignatiæ fl.	♏ 1– 6	0.066–0.400	methystice fl.	" 15–60	1.000–4.000
ipecac fl.	" 3–60	0.200–4.000	mezerei	gr. ½– 1	0.033–0.066

REMEDIES.	DOSE. APOTH.	DOSE. METRIC.	REMEDIES.	DOSE. APOTH.	DOSE. METRIC.
mezerei fl	♏ –10	0.200–0.666	Extr. prun. vigr fl	♏ 30-60	2.000-4.000
micromeriæ	" 15–60	1.000.4.000	pteleæ	" 15-30	1.000-2.000
mitchellæ fl	" 30–60	2.000–4.000	pulsatillæ fl	" 2- 5	0.133-0.333
myricæ fl	" 30–60	2.000–4.0000	quassiæ	gr. 1- 5	0.066-0.333
nectandræ	ʒ 1– 4	4.000–16.000	quassiæ fl	♏ 30-60	2.000-4.000
nuc. vom	gr. ⅛–½	0.008–0.033	quercus fl	" 30-60	2.000-4.000
nuc. vom. fl	♏ 1– 5	0.066–0.333	rhamni cath. ft. fl	" 30-60	2.000-4.000
nuphar fl	" 5–15	0.333–1.000	rhamni purs. cort. fl	" 30-120	2.000-8.000
nymphæ fl	" 5–15	0.333–1.000	rhei	gr. 5-15	0.333-1.000
œnotheræ fl	" 15–30	1.000–2.000	rhei fl	♏ 15-45	1.000-3.000
opii	gr. ⅙–½	0.011–0.033	rhus arom. fl	" 15-60	1.000-4.000
papaveris	" ½– 2	0.033–0.133	rhus glabr. cort. fl	" 30-60	2.000-4.000
papaveris fl	♏ 15–45	1.000–3.000	rhus glabr. fruct. fl	" 30-60	2.000-4.000
pareiræ fl	" 30–60	2.000–4.000	rhus toxicod. fl	" 1- 6	0.066-0.400
petroselina fl	ʒ 1– 2	4.000–8.000	ricini fol. fl	ʒ ½- 2	2.000-8.000
phellandrii fl	" 1– 2	4.000–8.000	rosæ fl	" ½- 2	2.000-8.000
phoradend fl	" ½– 1	2.000–4.000	rubi fl	♏ 15-60	1.000-4.000
physostigmæ	gr. 1/16– ⅙	0.004–0.011	rumicis fl	" 30-60	2.000-4.000
physostigmæ fl	♏ 1– 3	0.066–0.200	rutæ fl	" 15-30	1.000-2.000
phytolaceæ baccar fl	" 5–30	0.333–2.000	sabbatiæ fl	" 30-60	2.000-4.000
phytolaceæ rad	gr. 1– 3	0.066–0.200	sabinæ fl	" 5-15	0.333-1.000
phytolaceæ rad. fl	♏ 5–30	0.333–2.000	salicis fl	ʒ ½- 2	2.000-8.000
pilocarpi fl	" 15–60	1.000–4.000	salviæ fl	" ½- 2	2.000-8.000
pimentæ fl	" 15–45	1.000-3.000	sambuci fl	" ½- 2	2.000-8.000
piper. nigr. fl	" 15–45	1.000-3.000	sanguin fl	♏ 5-15	0.333-1.000
piscidiæ fl	" 15–60	1.000-4.000	santali citr. fl	ʒ 1- 2	4.000-8.000
podophylli	gr. ½– 1½	0.033-0.100	santonicæ fl	♏ 15-60	1.000-4.000
podophylli fl	♏ 8–30	0.533-2.000	sarsap. fl	ʒ ½- 2	2.000-8.000
polygoni fl	" 15–30	1.000-2.000	sarsap. comp. fl	" ½- 2	2.000-8.000
polygonati fl	" 5–15	0.333-1.000	sassafras fl	" ½- 2	2.000-8.000
populi fl	" 30–60	2.000-4.000	scillæ fl	♏ 5-30	0.333-2.000
prinos fl	" 30-60	2.000-4.000	scillæ comp. fl	" 5-30	0.333-2.000

Remedies.	Dos. Apoth.	Dose. Metric.	Remedies.	Dose. Apoth.	Dose. Metric.
scoparii fl	ʒ ½- 2	2.000-.4000	verbenæ	" 15-60	1.000-4.000
scutellariæ fl	ʒ ½- 2	2.000-8.000	viburniopuli fl	ʒ 1- 2	4.000-8.000
senecionis fl	" 1- 2	4.000-8.000	viburni (prunifol.) fl	" 1- 2	4.000-8.000
senegæ fl	♏ 8-15	0.533-1.000	wahoo	gr. 1- 5	0.066-0.333
sennæ fl	ʒ 1- 4	4.000-16.000	xanthoxyli cort. fl	♏ 15-30	1.000 2.000
serpent. fl	♏ 30-60	2.000-4.000	xanthoxyli fruct. fl	" 15-30	1.000-2.000
simarubæ fl	" 15-30	1.000-2.000	zingiberis fl	" 8-30	0.533-2.000
solidag fl	" 30-60	2.000-4.000	Fel bovis purif	gr. 3- 6	0.200-0.400
spigeliæ fl	" 15-60	1.000-4.000	Ferri arsen	" 1/20-½	0.003-0.000
spigeliæ et sennæ fl	℥ ½- 2	2.000-8.000	benzoas	" 1- 5	0.066-0.000
stillingiæ fl	" ½- 2	2.000-8.000	bromid	" 1- 5	0.066-0.000
stillingiæ comp. fl	" ½- 2	2.000-8.000	carb. sacch	" 4-15	0.267-1.000
stramonii (Engl.)	" ½- 1	0.033-0.066	chlorid	" 1- 3	0.066-0.200
stramonii fol. alc	" ⅓-⅔	0.022-0.044	citr	" 5-10	0.333-0.666
stramonii sem	" 1/6-½	0.011-0.033	et ammon. citr	" 5-10	0.333-0.666
stramonii fl	♏ 1- 6	0.066-0.400	et ammon. sulph	" 5-10	0.333-0.666
sumbul fl	" 15-60	1.000-4.000	et ammon. tartr	" 5-15	0.333-1.000
taraxaci	gr. 5-15	0.333-1.000	et cinchonid. citr	" 5-10	0.333-0.666
taraxaci fl	ʒ ½- 2	2.000-8.000	et pot. tartr	" 15-60	1.000-4.000
thujæ fl	♏ 8-15	0.533-1.000	et quin. citr	" 5-10	0.333-0.666
toxicodendri fl	" 1- 5	0.066-0.333	et strych. citr	" 1- 5	0.066-0.333
trifol. prat fl	ʒ 1- 2	4.000-8.000	hypophosph	" 5-10	0.333-0.666
trillii fl	" ½- 2	2.000-8.0000	iodidum	" 1- 5	0.066-0.333
trit. rep. fl	" 1- 4	4.000-16.000	iodidum sac	" 2- 3	0.133-0.200
tussilag. fl	♏ 30-60	2.000-4.000	lactas	" 1- 3	0.066-0.200
urticæ rad. fl	" 5-15	0.333-1.000	oxalas	" 1- 3	0.066-0.200
ustilag. maid fl	" 15-60	1.000-4.000	oxid. magnet	" 5-10	1.333-0.066
uvæ ursi fl	" 30-60	2.000-4.000	oxid. hydrat	ʒ ½- 2	6.000-64.000
vaccin. crassifol. fl	" 30-60	2.000-4.000	phosphas	gr. 1- 5	0.066-0.333
valerian	gr. 5-15	0.333-1.000	pyrophosph	" 1- 5	0.066-0.333
valer. fl	♏ 30-60	2.000-4.000	subcarb	" 5-30	0.333-2.000
veratr vir. fl	" 2- 8	0.133-1.533	sulphas	" 1- 3	0.066-0.200

REMEDIES.	DOSE. APOTH.	DOSE. METRIC.	REMEDIES.	DOSE. APOTH.	DOSE. METRIC.
sulph. exsic	" ½- 1½	0.033-0.100	Liq. ammon. acet	ʒ 2- 8	8.000-32.000
valer	1- 3	0.066-0.200	acidi arseni	♏ 2- 7	0.133-0.467
Ferrum dialys	♏ 1-15	0.066-1.000	arsen et hydr. iod	" 2-7	0.133-0.467
reduct	gr. 1- 5	0.066-0.333	ferri chloridi	" 2-10	0.133-0.666
Gamboge	♏ 1- 4	0.066-0.267	ferri dialys	" 1-15	0.066-1.000
Gaultheria, oil of	" 3-10	0.200-0.666	ferri nitrat	" 8-15	0.533-1.000
Guarana	gr. 8-30	0.533-2.000	pepsini	ʒ 2- 4	8.000-16.000
Hydrarg. chlo. corros	" 1/64-1/10	0.001-0.006	Liquorpotassæ	♏ 5-30	0.333-2.000
chlorid. mite	" 1/6- 8	0.011-0.533	potas. arsen	" 3- 7	0.200-0.467
iodid. flav	" 1/6- 1	0.011-0.066	potas. citrat	ʒ 2- 4	8.000-16.000
iodid. rubr	" 1/50-1/10	0.0013-0.006	Liquor sodæ	♏ 5-30	0.333-2.000
iodid. vir	" 1/6- 1	0.011-0.066	sodii arsen	" 3- 7	0.200-0.467
subsulp. flav	" ¼-½	0.016-0.033	Lithii benzoas	gr. 2- 5	0.133-0.333
c. creta	" 3- 8	0.200-0.533	bromid	" 1- 3	0.066-0.200
Hydrastin	" 5-10	0.333-0.666	carb	" 2- 6	0.133-0.400
Hyoscine	" 1/100-1/70	0.00067-0.001	citr	" 2- 5	0.133-0.333
Hyoscyamina and salts	" 1/138-1/32	0.0005-0.002	salicylas	" 2- 8	0.133-0.533
Hypnone	♏ 5-10	0.033-0.066	Lupulinum	" 5-10	0.333-0.666
Ichthyol	gr. 3- 4	0.200-0.266	Magnesia	" 15-60	1.000-4.000
Infusum bray	℥ 2- 8	64.000-256.000	Magnesii carb	" 16-60	1.000-4.000
digitalis	ʒ 2- 4	8.000-16.000	citr. gran	ʒ 2- 8	8.000-32.000
sennæ comp	℥ 1- 2	32.000-64.000	sulphas	" 2- 8	8.000-32.000
Iodoformum	gr. 1- 3	0.066-0.200	sulphis	gr. 8-30	0.533-2.000
Iodol	" 1/6-½	0.011-0.033	Manganese binox	" 2- 4	0.133-0.233
Ipecacuanha expect	" 1/6- 1	0.011-0.066	Mangani sulph	" 2-10	0.133-0.666
emetic	" 15-30	1.000-2.000	Manna	℥ 1- 2	32.000-64.000
Jalaph	" 15-30	1.000-2.000	Massa copaibæ	gr. 5-30	0.333-2.000
Kairine	" 3-30	0.200-2.000	ferri carb	" 5-15	0.333-1.000
Kamala	ʒ 1- 2	4.000-8.000	hydrarg	" 1-15	0.666-1.000
Kino	gr. 8-30	0.533-2.000	Mist. ammon	ʒ 4- 8	16.000-32.000
Lactucarium	" 8-15	0.533-1.000	asafœtidæ	" 4- 8	16.000-32.000
Lewininp c. sol	50 p. c.		chloroformi	" 1- 2	4.000-8.000

Remedies.	Dose Apoth.	Dose Metric.	Remedies.	Dose Apoth.	Dose Metric.
cretæ	℥ 1- 2	32.000–64.000	sulphas	gr 1/128– 1/64	0.0005–0.001
ferri comp	“ ½-2	16.000–64.000	Picrotoxinum	“ 1/64-⅛	0.001–0.008
ferri et amm. acet	“ ½-1	16.000–32.000	Pilocarpina and salts	“ 1/64-½	0.001-0.033
glycyrrh. comp	ʒ 1- 4	4.000–16.000	Pil. aloes	Pills 1- 3	
magnes. et asafœt	“ 1- 4	4.000–16.000	aloes et asaf	“ 2- 5	
potassii citr	℥ ½-2	16.000–64.000	aloes et ferri	“ 1- 3	
rhei et sodæ	“ ½-1	16.000–32.000	aloes et mast	“ 1- 3	
Morphina and its salts	gr. 1/16- ½	0.004–0.033	aloes et myrrhæ	“ 2 -5	
Moschus	“ 2-15	0.133–1.000	antim. comp	“ 1- 3	
Narceina	“ 1/6-½	0.011–0.033	asafœtidæ	“ 1- 6	
Nitroglycerine (1 per cent. sol.)	ʒ 1	4.000	cathar. comp	“ 1- 4	
Nux vomica	gr. 1- 5	0.066–0.333	ferri comp	“ 2 -5	
Oleoresina aspidii	“ 15-60	1.000–4.000	ferri iodide	“ 1- 4	
capsici	“ 1/6-½	0.011–0.033	galbani comp	“ 1- 5	
cubebæ	♏ 5-20	0.333–1.333	opii	“ 1- 2	
filicis	“ 30-60	2.000–4.000	phosphori	“ 1- 4	
lupulini	gr. 2- 5	0.133–0.333	rhei	“ 2- 5	
piperis	“ 1- 3	0.066–0.200	rhei comp	“ 2- 5	
zingiberis	„ 1– 3	0.066–0.200	Piperinum	gr. 1- 8	0.066–0.533
Oleum copaiba	♏ 8-15	0.533–1.000	Plumbi acetas	“ ½- 3	0.033–0.200
cubebæ	“ 15-30	1.000–2.000	iodidum	“ ½- 3	0.033–0.200
eriger	“ 5-15	0.333–1.000	Potassii acetas	“ 15-60	1.000.4.000
eucalypti	“ 5-10	0.333-0.666	bicarb	“ 8-60	0.533.4.000
phosphorat	“ 1- 3	0.066–0.200	bitartr	ʒ 1- 2	4.000–8.000
sabinæ	“ 1- 3	0.066–0.200	bromid	gr. 8-60	0.533–4.000
terebinth	“ 5-30	0.333–2.000	carb	“ 8-30	0.533–2.000
tiglii	ʒ 1/6- 1½	0.666–6.000	chloras	“ 8-30	0.533–2.000
Opium (14 per cent. morphine)	gr. 1/6- 1½	0.010–0.100	citras	“ 15-60	1.000–4.000
Pepsinum pur	“ 15- ʒ½	1.000–2.000	cyanid	“ 1/16-⅛	0.004–0.008
saccharatum	“ 30-ʒ1	2.000–4.000	et sodii tartr	℥ ½- 1	16.000–32.000
Phosphorus	“ 1/128 1/50	0.0005–0.0013	hypophosph	gr. 5-15	0.333–1.000
Physostigmin salic	“ 1/120 1/64	0.0005–0.001	iodid	“ 2-15	0.133–1.000

REMEDIES.	DOSE APOTH.	DOSE METRIC.	REMEDIES.	DOSE APOTH.	DOSE METRIC.
nitras	gr. 8-15	0.533-1.000	Resorcin	gr. 2- 5	0.133-0.333
sulphas	ʒ 1- 4	4.000-10.000	Rheum	“ 2-30	0.133-2.000
sulphidum	gr. 1-10	0.066-0.666	Salicinum	“ 8-30	0.533.2.000
sulphis	“ 15-30	1.000-2.000	Salol	“ 10-15	0.666-1.000
tartras	ʒ 1- 8	4.000-32.000	Santonica	“ 8-60	0.533-4.000
Pulv. antimon	gr. 1- 3	0.066-0.200	Santoninum	“ 1- 5	0.066-0.333
aromat	“ 8-30	0.533-2.000	Sapo	“ 5-30	0.333-2.000
cretæ comp	“ 8-30	0.533-2.000	Scammonium	“ 3-15	0.200-1.000
glycyrrh. comp	“ 30-60	2.000-4.000	Senna	“ 8-60	0.533-4.000
ipecac. comp	“ 5-15	0.333-1.000	Sodii acetas	“ 15-60	1.000-4.000
jalapæ comp	“ 30-60	2.000-4.000	arsenias	“ 1/64-1/10	0.001-0.006
morph. comp	“ 8-15	0.533-1.000	benzoas	“ 5-15	0.333.1.000
rhei comp	“ 30-60	2.000-4.000	bicarb	“ 8-30	0.533-2.000
Quinidina and salts	“ 1-30	0.066-2.000	bisulphis	“ 8-30	0.533-2.000
Quinina and salts	“ 1-30	0.066-2.000	boras	“ 8-30	0.533-2.000
Quinin. arsen	“ ⅙- 1	0.011-0.066	bromid	“ 8-30	0.533-2.000
Resina copaib	“ 2-10	0.133-0.666	carb	“ 8-30	0.533-2.000
jalapæ	“ 2- 5	0.133-0.333	carb. exsicc	“ 5-15	0.333-1.000
podophylli	“ ⅛-½	0.008-0.033	chloras	“ 5-30	0.333-2.000
scammonii	“ 2-10	0.133-0.666	hypophosph	“ 8-15	0.533-1.000

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